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IN EXCHANGE.

The St. Bartholomew's Hospital Reports.
The St. George's Hospital Reports.
The London Hospital Reports.
The Pharmaceutical Journal.
American Journal of Medical Science (care of Messrs. Trübner and
Co., 60, Paternoster Row, E.C.)
Annales de Dermatologie et de Syphiligraphie (care of M. le Dr.
Doyon, 33, Rue de Jarente, Lyon, Rhône).

The Subscription List for Vol. XVI will be closed on the 1st of
November, 1870.



SELECT CLINICAL CASES,

INCLUDING CASES OF

LABIO-GLOSSO-LARYNGEAL PARALYSIS; EXOPHTHALMIC GOITRE; ARTERIAL PYÆMIA; GENERAL CHRONIC ARTERITIS; SATURNINE GOUT.

BY SAMUEL WILKS, M.D.

IN reviewing the cases that have been in my wards during the last year, I have selected those for record which illustrate some of the maladies that have most recently attracted the attention of the profession; maladies which have now received distinct appellations, and been added to the list of our nosology. It may be remarked how a clinical observation and study of pathology have in many instances enabled us to place together certain morbid conditions which were before isolated, and yet at the same time it must also be remarked how further researches in the wards and post-mortem room have obliged us to recognise fresh groups of ever-recurring symptoms and morbid appearances, compelling us to seek for new names; and, as it were, to frame new diseases. In the past volumes of these Reports there will be found essays by the members of the hospital staff on diseases quite unknown to our forefathers, such as Bright's disease, Addison's disease of the supra-renal capsules, the peculiar affection of the lymphatic glands, which has been styled Hodgkin's disease, lardaceous disease, internal syphilitic affections, besides various essays on newly-described skin diseases. I now offer a few remarks on the subjects of labio-glossolaryngeal paralysis, exophthalmic goitre, arterial pyæmia, general chronic arteritis, and saturnine gout.

LABIO-GLOSSO-LARYNGEAL PARALYSIS.

I publish a few cases of this form of disease in order to show that those accurate observers, Duchenne and Trousseau, were right in assigning a distinctive name to a malady displaying such distinctive phenomena as this does, being due in all probability to a very limited lesion of the medulla oblongata. The mere concurrence of certain definite symptoms might have been sufficient to warrant the belief that an important anatomical centre had been touched ; but now, since the publication of the lectures of Trousseau, this has been made more than probable by the researches of Mr. Lockhart Clarke, who has demonstrated how certain nerves which are implicated in this form of paralysis are associated at their origins in the medulla ; and all that is wanting to complete the history of the disease is the careful dissection of the nerve centres in a certain number of cases of those who have died of this form of paralysis. The anatomist and the physiologist have in fact informed the clinical physician of the precise spot which is affected, and it only remains for the pathologist to prove it. Of the cases given below only one was fatal, and that was in all probability not a pure and simple example of the disease, and thus the present communication will not afford any great addition to its pathology.

The publication of Trousseau's lectures removes the need of occupying our space with a lengthened description of the disease, which he has styled "labio-glosso-laryngeal paralysis ; suffice it to say, that it appears as definite in its characters as does hemiplegia, or any other distinct form of paralysis ; a person indeed may be suddenly seized with a fit, and very shortly display all the symptoms of the disease. It is a paralysis, as the name implies, affecting the lips, mouth, tongue, and larynx ; and therefore, as might be supposed, the functions of eating, swallowing, and talking, are much interfered with ; the nerves known as the seventh, eighth, and ninth, being in part paralysed. Should the affection have come on suddenly, or should it have been developed slowly, the phenomena are the same. These are so striking, that the nature of the case is soon evident. The face has lost its expression from a partial paralysis of the facial nerves, and should the sufferer attempt to speak, it is in

vain, for beyond making a few unintelligible noises, his power of utterance has gone. The reason for this will be found in a weakened condition, not only of the muscles of the face and of the tongue, but of the larynx itself. The lips can be adjusted only for the formation of certain letters, as Trousseau has fully explained; the tongue can be but slightly moved, and cannot be thrust out of the mouth; and when the patient is asked to cough, he produces only the faintest sound in his larynx, not being able to close the organ. At the same time he eats with difficulty; he cannot collect the food in his mouth; he is obliged to assist with his fingers to extract it from his cheeks, and place it at the back of the tongue, when it is swallowed with difficulty. For the same reason the saliva cannot be retained, but is constantly pouring from the mouth; the muscles of the soft palate hang down flabby, so that the posterior nares cannot be closed, and both the velum and larynx may have lost some of their sensibility. The appearance of such a patient is generally very striking and characteristic; he is seen with a pocket handkerchief to the mouth, with a vacant expression, or making a few grotesque movements of the face in the endeavour to force out a word, and with a slate or paper before him on which he writes down all his wants. The speech, it may be remarked, is not merely thick, as in simple facial paralysis, nor is there that meaningless gabble which is heard in the aphasic patient; but it is either utterly gone, or only a syllable in a nasal twang can be produced at a time after violent attempts to set the muscles in motion; there is, in fact, a paralysis of all the parts employed in talking.

It may be remarked that though the capability of speech has entirely gone, from a paralysis of the nerves which supply the muscles employed, yet the trunk of the nerve need not be wholly paralysed, nor have other parts supplied by it lost the whole of their functions. Thus the face may be fallen and the mouth paralysed, but the patient has power to close the eyes, showing that the orbicularis palpebrarum is not affected. In the same way, although the larynx is paralysed for talking, it is unimpaired for breathing. This would show, Trousseau observes, that for its two separate functions, vocalisation and respiration, it must have two nerves, supplied from different sources. Now, the recurrent is almost the sole motor

nerve to the muscles of the larynx, and, consequently, if it is injured or pressed upon the organ is wholly paralysed and the patient is suffocated. It would follow, then, that this nerve is a compound one, and sends a twofold stimulation to the muscles by filaments having their sources in the centres of respiration and vocalisation. Marshall says: "When the roots of the spinal accessory are cut, the operation does not impair any of the respiratory movements, but swallowing is interfered with and the voice ceases, the animal emitting only a bubbling noise. Extirpation of one accessory nerve causes hoarseness. Thus it appears that the spinal accessory governs the momentary and voluntary opening or closure of the glottis and tension of the vocal cords necessary for the production of the voice, or for the exercise of general muscular effort, whilst the respiratory movements of the glottis are under the control of the pneumogastrics." It has long been considered that there is a region in the medulla which may be called the respiratory tract, a region to which branches of all the nerves engaged in the respiratory process may owe their origin; in like manner it would appear that as a large number of parts are engaged in the act of talking, so the nerves supplying them must be stimulated from a common centre, and thus the explanation how so complex a function should suddenly cease from lesion of one small spot. Now, the proof of this lies in the dissections of Mr. Lockhart Clarke, which demonstrate the connection between the facial, vagus, hypoglossal, and laryngeal nerves. The latter are, in fact, branches of the spinal accessory which, joining the pneumogastric, are given off as the recurrent laryngeal motor nerves. The spinal accessory has two origins: the lower from rootlets arising from the antero-lateral substance of the spinal cord and lower part of the medulla, and collected into the external branch to supply the sterno-mastoid and trapezius muscles; the upper from a special nucleus behind the central canal, which, going to form the internal branch, proceeds to the vagus, and is subsequently distributed to the larynx, pharynx, and palate. If, then, the centre whence this proceeds be injured, the larynx loses that power which this nerve had previously induced, that is, there is loss of vocalisation whilst the respiratory power remains. Mr. Lockhart Clarke has shown that there is a close anatomical connection between the nuclei

of the hypoglossal, vagus, spinal accessory, facial, and trigeminal nerves. There is a column of cells forming the nuclei of these nerves which supplies all the parts used in speaking. It may be true that for several other combined movements there may be controlling centres, and thus there has long been a very general belief that the grouping together of several muscles in the limbs for a common movement is due to the stimulation of various filaments of nerves from special centres in the cord.

It appears remarkable that a small area in the medulla oblongata, or even the olivary body, coinciding with a physiological centre as that of articulation, should be picked out to undergo a rapid or slow morbid change. So remarkable is the fact that it might be worthy, in the first place, of inquiry whether or not experience justifies us in declaring that definite parts of the cerebro-spinal centres having special functions are more prone to disease than other portions of the brain and spinal cord taken indifferently; whether, indeed, all parts are not equally liable to inflammation and degeneration, but it is only when certain physiological portions are affected that we are enabled to apply our names, because then the seat of disease has made itself manifest by the implication of nerves whose function is known, whilst in other cases we are content to use such expressions as cerebral or spinal disease. Although I believe this to be to a certain extent true, yet I consider it is proved that those parts of the cerebro-spinal system which have definite physiological properties are more liable to disease than other spots taken indiscriminately; if so it may show, as is most probably the case, that the vascular supply of such physiological centres is accurately defined and circumscribed, or it may be that a centre having a definite function, being the focus of a number of nerve filaments proceeding from it for a special purpose, must soon be affected if any of these filaments be primarily attacked, seeing that morbid processes quickly proceed along given anatomical tracks. If, then, degenerative processes occur in connection with a morbid state of blood-vessels, and if the anatomical supply bears a relation to defined physiological areas, the explanation of such parts being selected for chronic disease is not so difficult; and if again morbid processes proceed rapidly along nerve filaments, we can under-

stand also how parts having intimate relations are concurrently affected. It is a remarkable circumstance that there is no disease of the nervous system, as far as I am aware, which may prove fatal, and even show a well-marked lesion or degenerative change after death, but may have its counterpart in a functional and curable disorder. This must clearly show that, although in actual blood effusions or softening the seat of disease may appear accidental, these centres must have been affected from a more precise anatomical reason. For example, an effusion of blood in the corpus striatum productive of a hemiplegia may appear to be accidental, but a temporary hemiplegia of a few hours' duration, as seen after an epileptic fit, and due to a derangement of a part having a very limited area, can only be accounted for on the supposition that physiological districts of the brain are anatomically defined. It is the same with diseases of the spinal cord, every variety of which may occur as a temporary disorder. Let it be said, for example, that paralysis of motion and sensation imply definite lesions of the motor and sensory tracts, then the function of these tracts must be in temporary abeyance to account for the paralysis which occurs in those patients who perfectly recover. Again, let it be said that distinct nervous lesions are discovered in cases of progressive muscular atrophy; we must suppose that in those very severe cases which recover these same special parts of the cord were for a time powerless. Or, if in locomotor ataxy it be shown that the posterior columns of the cord have undergone grey degeneration, it must be believed that those same parts are involved in some way in the cases which recover. All these circumstances would show that of the various nervous ailments which we meet with a large number have a determinate and fixed character owing to certain distinct anatomical and physiological centres being involved. In hysteria it is known that every possible nervous disorder may be simulated, and amongst these I have seen a tolerably fair example of labio-glosso-laryngeal paralysis.

It is worthy of note that in the disease especially under consideration the symptoms appeared suddenly in some of the cases, in others they were of slower progress. It is not remarkable that in some cases the motor tracts should be also involved, and that, combined with the symptoms above

mentioned, there should exist also various degrees of paraplegia or paralysis of the limbs.

I have seen several cases of this form of disease in private. In one, an old lady, lately dead, the disease had been progressing for some years; her difficulty of swallowing had been so great, that on one occasion a probang was passed down the throat, in order to see if there was any obstruction. In another case, a woman of middle age, the attack came on suddenly, as one of ordinary hemiplegia. She rapidly recovered the use of her limbs, so as to be able to walk two or three miles daily, but she remained speechless; she could not protrude her tongue, and could scarcely open her mouth; she was fed with a spoon, and the saliva was constantly dribbling from her mouth. In the case of a lady somewhat older, whom I watched for two or three years, the attack came on as a fit during dinner; she fell off her chair, and was taken up to bed; it was found that her senses had not left her, but she was unable to speak. In a day or two she got up, and appeared very well; but she never spoke again, and could not swallow without great difficulty. She subsequently attended to her household affairs, would play cards with the family, and walk three or four miles daily, but she was obliged to communicate all her wants by writing. Her greatest trouble, however, was the inability to hold her saliva, which was constantly dribbling from her mouth. She had finally a fatal apoplectic attack, in which the effused blood ploughed up the pons varolii; but at its lower part there was an old brownish cyst.

In the case of a woman who was under my care in the hospital some years ago with this form of disease, combined with partial paraplegia, she was unfortunately allowed to feed herself, and on one occasion a large piece of meat stuck in her throat and choked her—an accident not unlikely to happen in this disorder.

The first case which I describe, and the only one in which I have been able to obtain a post-mortem examination, was not a simple case of labio-glosso-laryngeal paralysis, but was associated with progressive muscular atrophy, and therefore the appearances described by Dr. Moxon must be taken as exponents of the latter disease as well as the former. On the first visit to such a case it might have appeared to be

simply one of muscular atrophy or Cruveilhier's paralysis, which was now approaching its climax by implication of the muscles of respiration. The history of the case, however, did not bear out this supposition, and, moreover, there was no evidence of wasting of the tongue or muscles of the larynx. Supposing the disease had begun in the medulla, as one of labio-glosso-laryngeal paralysis, and had then spread to the motor strands of the cord and the motor nerves, it would be a good confirmation of the fact that progressive muscular atrophy has a central origin, and is not a local disease.

CASE (from the Report of the Ward Clerk, Mr. Mallam).

Labio-glosso-laryngeal Paralysis, combined with Muscular Atrophy. Atrophy of the Medulla Oblongata with Atrophy and Degeneration of the Spinal Motor Tracts and the Motor Roots of the Nerves.

William C—, æt. 46, admitted under Dr. Wilks, November 9th, 1867, and died December 28th. He was a leather-dresser by trade. Five years ago he was in the hospital for rheumatic fever, since then he has enjoyed good health until June last, when he began to experience some soreness in the throat and difficulty in swallowing. Towards the latter end of September he lost partial use of his hands and legs, the left side being most affected; but he continued at work until three weeks before admission, when he fell down and was unable to rise again. He has gradually been getting worse since.

On admission he was seen to be a short, old-looking man, with his head sunk between his shoulders, and he had a vacant expression of countenance. He was thin, and his muscles flabby. His eyesight had of late become much impaired; but his pupils contracted under the influence of light, and there was no paralysis of the muscles of the eyeball. He had had pain for some time in the course of the fifth nerve, tactile sensibility was good over the face, and the muscles of mastication appeared to act well. There was a want of expression in the face, and although the mouth was not drawn to either side, the orbicularis oris had lost some of its power, as the saliva was constantly running out of the corners of the mouth; the

buccinators appeared quite useless for the purpose of mastication, and he was obliged to press the food out of his cheeks with his fingers whilst eating. He could close the eyes, and the hearing was good. The back of the throat and soft palate appeared sensitive when touched, but the contractility of the latter seemed much impaired. He had much difficulty in swallowing food, and had to wash it down with fluid. He appeared to have lost power over the tongue, being able to move it but slightly. He spoke very indistinctly and thickly, so that his words were scarcely intelligible. It was seen also that he could scarcely move his chest, and that the breathing was mostly diaphragmatic; the chest was resonant, but on auscultation was found to be full of râles. He had great difficulty in expelling the mucus, being quite unable to cough out. As regards his limbs, there was a general deficiency in power, especially on the left side, so that he was scarcely able to support himself, and had very little use of his arms. The muscles at the same time were wasted, as was seen more especially in the arms, the wrists dropped, the fingers were flexed, and the interossei atrophied.

It will be seen that this man was partially paralysed in his limbs, and had almost lost the power of eating, swallowing, talking, or coughing, from paralysis of certain muscles above named. It will also be observed that, besides the labio-glosso-laryngeal paralysis, he had progressive muscular atrophy.

He was ordered to be galvanized with the continuous current every day for a quarter of an hour, one pole to be placed behind the mastoid process on the left side, the other lower down on the spine, and to take quinine mixture. The extensors of both hands were brought into action when either the induced or the continuous current was applied; but as regards the interossei, those of the right side were alone affected.

It appeared as if the galvanism was giving some tone to his muscles, and he expressed himself better, but at the same time it was evident that he was in constant danger of suffocation, from the accumulation of mucus in the air-passages; his slight hacking cough was constant and most distressing, and he would wake up in the night in fear of imminent choking.

He continued on with much the same symptoms, having great trouble in expectorating and difficulty in swallowing, so

that he had to push his food to the back of the mouth. He then began to be troubled with various neuralgic pains in the face, in the eyes, in the throat, and along the arms.

About a month after admission he appeared to have gained some power, he walked in the ward, he could raise the right arm over his head, he could move the tongue better and articulated more distinctly. About this time he had a fall which hurt his head and kept him in bed; after this he became worse, very low-spirited, speech less distinct, and appetite bad. The mucus collected in his chest, and his power of expectoration became lessened, and it was evident that he could not live long, and on Dec. 28, 1867, he died.

Post-mortem examination by Dr. Moxon; external appearances.—Frame short, slight, square built; features short, coarse, square; great wasting, especially of hands, the muscles of which were very deficient; complexion earthy, sallow.

Head and Spine.—There were no nodes, or other signs of disease of the cranial bones. The calvarium was removed, and the occipital part of the bony base cut out; the arches of the vertebræ were removed; and the cranial and spinal dura mater, their contents, and the cervical nerves, to the outer edges of the scaleni, were all removed together; the processes of dura mater in the sella-turcica, and the sphenoidal fissures, only being cut. The brain was tough and hard. There were no signs of formative disease; the changes required to be looked closely for. But on opening up the visceral arachnoid, there was a most obvious atrophy of the roots of the hypoglossal nerve, which had quite lost the natural white opaque appearance of nerves, and were little thin gelatinous threads as they crossed the corpora olivaria. In the same condition were the inner roots of the spinal accessory, and, also, very markedly, the whole of the anterior roots of the spinal nerves, especially the cervical, and least the sacral. The anterior view of the cord was remarkable, the outer aspect was flat, not round; yet it was harder than natural, so that mere flaccidness was not the cause of this; the anterior roots, also, came from a line much nearer the middle line than is natural. On section, the anterior half of the white matter was atrophied; it was white, harder than natural, and on the section it stood out, while the grey matter receded; the latter was larger than natural—it was darker,

containing obvious vessels, and at the lower part of the cervical cord it was double the natural size, and showed a red colour finely mingled with yellowish white: this part, so affected, was not of great length; generally the redness and largeness of the grey part, and the thin hard shell, or coat-like layer of white matter, made the pathological state of the spinal cord. In the medulla oblongata, as seen from the front, nothing diseased was visible, except the state of the nerve roots, as before stated. But on opening up the arachnoid over the fourth ventricle, and drawing down the medulla oblongata to look at the fourth ventricle, there was a very striking diseased appearance, without obvious derangement of anatomical position; there was a red-grey change of the calamus scriptorius, so that the nib of this was quite involved, and from the nib upwards and outwards, for half an inch, there ran this change. The lining membrane of this ventricle and its choroid plexus were of deeper colour than usual.

The natural curves of the spine, backwards in the dorsal, and forwards in the lumbar region, were very much exaggerated, so that the last lumbar vertebra and the promontory of the sacrum obstructed the entrance to the pelvis; the chest was barrel-shaped, and there were two (second and third) right ribs broken, and united at the attachment of the pectoralis minor.

Chest.—The costal cartilages were partially ossified. The right lung was much marked with pigment; the texture coarse, as from atrophic emphysema.

Abdomen.—The viscera were normal, except that the right kidney was moveable. Its position was such that the long axis of the organ was forwards instead of downwards, and it rested below on the colon, so that the colon had a renal flexure instead of a hepatic. Thus, when the abdomen was opened, and the parts as yet undisturbed, the lower end of the kidney projected forwards, below the liver, to the right of the gall-bladder and above the colon; the end of it came by the duodenum forwards, the side of the organ touching the second flexure of that bowel; it was kept in this place by a suspensory ligament of peritoneum, that came from the lower face of the liver, and branched, so that one arm went to the duodenum and the other to the end of the kidney. The

attachment of the omentum to the duodenal end of the stomach and transverse colon was below and internal to the lower end of the kidney, and the colon fitted into the deep recess below it; this recess went almost to the hilum of the organ behind, and so gave the kidney as good a "mesentery" as the ascending and descending colon usually possess, or, indeed, even a better.

Cecum contracted, appendix free, hanging into the pelvis.

Liver perfect in outline, capsule thin, tissue dark, healthy; half an ounce of dark bile in gall-bladder.

Labio-glosso-laryngeal Paralysis. (Reported by Mr. CHALMERS.)

Dominick K—, æt. 31, residing at Woolwich, was admitted into Stephen Ward, 19th August, 1867. The patient, a brick-layer's labourer, is a single man, and of temperate habits. He always enjoyed good health until the middle of July, when he went to bed well, but was unable to rise the following morning, having lost the use of his legs and arms during the night. His left side was paralysed in a greater degree than the right, and his speech and power of deglutition were also affected. He had been under medical treatment up to the date of admission, and his health had become slightly improved in consequence. He was able to walk without a stick, but with a tottering gait, though he was scarcely able to raise his feet from the floor. He could stand on the right leg without support, but not on the left, and his left knee was stiff.

Mastication and deglutition were difficult, and the tongue was only capable of very slow protrusion and retraction. The upper part of his face was unaffected; he could close his eyes firmly and quickly, but the lower part of his face was almost motionless; he could not whistle, and there was a want of expression in his countenance. His speech was thick, so that it was difficult to understand what he said. Six to eight ounces of saliva flowed daily from his mouth.

His urine passed from him very slowly, and at times he had to wait a few minutes before he could micturate. His urine was not albuminous; his bowels were regular; his tongue was clean, and he was in no pain; his appetite was very good.

August 21st.—He was free from pain. Ordered Mist. Quinæ ter die.

22nd.—The salivary glands were much excited, and fluid was constantly secreted.

26th.—Saliva was much less in quantity, and the patient felt better.

28th to 30th.—He was improving.

September 2nd.—He was stronger, though he did not feel able to walk without a stick. His throat was not sore, but felt somewhat constricted. His speech was somewhat clearer.

7th to 12th.—He had more power in his legs, and was able to get up and down stairs with the aid of a stick.

23rd.—He was able to retain his saliva, but there was very little improvement in his speech.

October 2nd.—There was very little change. His face had more expression in it, he was free from numbness, and his tactile sensibility was perfect.

7th to 26th.—There was very little change. His vocal cords were seen, by the aid of the laryngoscope, to move freely, both during respiration and when he made an effort to utter a sound; but when he tried to cough the vocal cords scarcely moved at all, and he was quite unable to effect his purpose, a slight hacking movement of expiration being all he could accomplish. This was probably due to a loss of co-ordination, as the vocal cords could be moved during speech.

29th to December 12th.—There was very little improvement, though the patient said he felt better, and the lower portion of his face was less paralysed.

December 14th to 26th.—He was a little better, able to speak with a little more clearness, and to swallow with a little less difficulty.

He was readmitted at the beginning of the following year, and remained in about two months, during which time his condition somewhat improved. He could walk about the ward, though dragging his legs, and had some more power in his arms. As regards his speech, he made a great contortion of his face in order to produce a word; but it was more intelligible than heretofore. On examination of the larynx with the speculum the right vocal cord moved slightly, but the left not at all. He seemed to have power over the soft palate to raise it.

Labio-glosso-laryngeal Paralysis.

Mary Jane D—, æt. 51, had been in the hospital on several occasions ; first in 1864, then in 1866, and again in 1867. She was a married woman with a large family. Her history as she endeavoured to relate it by monosyllables and by writing was, that on May 14th, 1864, she went to bed quite well, but awoke early in the morning, finding the right arm quite powerless and the right leg weak ; the speech was somewhat affected, but improved in the course of the day. In four or five months the arm recovered sufficiently to enable her to use her needle, and she remained tolerably well until the following May, when she had another attack, but on this occasion her jaw was almost fixed, so that she had great difficulty in speaking and eating. During the following six weeks a gradually increasing paralysis came over her, affecting all her limbs and her face.

When she was admitted on January 31st, 1866, she was observed to be a thin, short, old-looking woman, having an anxious expression of countenance, and not able to walk with vigour from some weakness of the legs ; the arms were also somewhat weak, but more especially the right. She had almost total loss of utterance, so that on endeavouring to speak she only made some almost unintelligible noises ; the voice was also weak. She had some difficulty in opening the mouth, which was drawn slightly to the left side ; she also had some difficulty in closing the right eye, and the lower lid of the left eye was slightly drawn down ; there was thus a more or less paralysis of all the muscles of the face ; no loss of sensation. For a long time she had been unable to swallow any solid food, and had been living on liquids, always taking care to place everything far back on her tongue. There also appeared to be some paralysis of the right pillar of the fauces ; some dimness of sight ; tremor of lips. She had headache, especially over the forehead. She used a slate and pencil to communicate her wants. Heart and lungs healthy. She remained in hospital until September.

She was admitted under Dr. Wilks, October 30th, 1867, and remained in for six months without much alteration in her condition. She sat in her chair all day long, as she could not walk well ; the arms were also weak, although she was able to

write. She had lost complete power of utterance, and was in the habit of putting down all her wants on a slate. She usually sat with a handkerchief to her mouth to catch the saliva which was constantly dribbling from it.

Labio-glosso-laryngeal Paralysis.

John O—, a young man, admitted under Dr. Wilks' care, Feb., 1869. He was a sailor, and whilst at Singapore had what was believed to be a sunstroke. Thirteen months afterwards, whilst on his voyage homewards, he had a fit, in which he fell down and lost the use of his left side, including the face, but he did not lose consciousness. He was gradually recovering, when six weeks afterwards he had another similar attack. He has been a temperate man, and has never had syphilis. He had partial paraplegia, besides the symptoms of the affection under discussion. He was only just able to stand, and the power in his arms was but slight. When he first came in he was quite unable to articulate, but after a few days he was able to make some noises, which in a few instances could be interpreted into words. His efforts to speak were painful to witness, as very little resulted from them beyond a few meaningless words. Although he was able to make these faint noises he had not the slightest power to cough. He moved his chest well, and inflated his lungs thoroughly, but every now and then he sighed as if there was some restraint upon the respiratory apparatus. Both facial nerves were partially paralysed; he was unable to screw his lips together in order to whistle or to form labial letters; and some others such as 'k,' he was quite unable to pronounce. He swallowed with difficulty, the nurse feeding him with a spoon, and placing the food at the back of the tongue. He slobbered very much, the saliva constantly running from the corner of his mouth. On examining the throat there was no movement of the palate when he drew in his breath. He put out his tongue a little distance and very slowly. His mind was quite clear. Sent to the West of England to his friends.

Labio-glosso-laryngeal Paralysis.

Mr. H—, æt. 27, a fine young man, who had lived rather freely, and might very probably have had constitutional syphilis, was seized with a fit on the night of January 5th, 1869. This appeared to be of the ordinary hemiplegic character, arising from effusion of blood. Feeling ill he attempted to get out of bed, and then he fell, the noise produced arousing those in the house, who found him on the floor and put him to bed, and when I saw him a few hours afterwards he was paralysed on the left side, but was quite conscious; he rapidly recovered, and at the end of a month was able to walk about and return to his employment. He had never, however, completely regained the strength of the arm and leg. On August 3rd he again had a fit, but on this occasion it was of an epileptic nature, and soon afterwards he had another, and then a succession of them for a few hours. In these attacks he struggled violently, but he said never lost his consciousness; and between the paroxysms he talked quite rationally. On the following day he was better and had no more fits, but it was observed that his speech was failing, and at the end of the week he could not utter a word. When I saw him again and during some weeks afterwards (even to the present time), he was the subject of the complaint under consideration in its most marked form. His face had lost somewhat of its usual expression, and when he smiled the mouth on the right side was slightly drawn up, at the same time the lips were well retracted so as to show the teeth, proving that the orbicularis oris still retained much of its power. He could also close his eyes. If asked to speak he opened his mouth and laughed, but could not utter a single word. Not only was he incapable of forming a word with his lips, but his larynx failed to produce the feeblest note. On asking him to cough it was only once that a slight gurgling was made, in all other attempts he could not produce the faintest sound. The saliva was running from his mouth, necessitating the constant use of a handkerchief. When requested to drink, he allowed a good deal of the fluid to escape from his mouth. He was said to have much difficulty in eating and swallowing, the food collecting in his cheeks, and thus it was generally placed far back

on the tongue to enable him to grasp it. He could protrude his tongue a little distance from the mouth, but it was done slowly and with effort. On examining the throat, the velum was seen to hang loosely down. He had no power to raise it, and touching it with the feather of a pen did not excite it to action. He, however, said he could feel it being touched. His intellect was quite clear.

EXOPHTHALMIC GOITRE.

I introduce the subject of exophthalmic goitre mainly for the purpose of enabling me to record a fatal case in which the post-mortem examination was carefully made by Dr. Moxon. The accompanying plate affords a very good representation of the disease, showing the wasted frame, enlarged thyroid gland, and prominent eyeballs. I may just remind the reader that the examination was made more especially to search out a cause for the disease in the nervous system, according to the prevalent theory. It is now many years since Dr. Graves, Dr. Begbie, and others, observed some of the more striking features of this remarkable complaint, but it is only of recent years that the whole combination of symptoms has been recognised. These symptoms, which characterise the disease, are a protruding eyeball, an enlarged thyroid, palpitation of the heart, and a thrill in the blood-vessels; in addition there is a general wasting, great muscular prostration, and a capricious appetite. (In the fatal case to be described there was vomiting occasionally, and at other times the appetite was ravenous.) The heart beats very frequently, perhaps at the rate of 150 per minute; but, as a rule, no abnormal sounds are discoverable. Sometimes a faint systolic infra-mammary bruit, rarely a systolic over the base of the heart, may be discovered, but there is generally no evidence of organic disease. Over the larger vessels there is always a loud "bruit de diable" to be heard, or a loud rushing sound like the roaring of the sea, and at the same time a remarkable thrill given to the finger when placed upon them. The heart, on examination after death, has been found in some cases enlarged, or the left ventricle dilated, but this in all probability has been a result rather than a cause of the disease.

The thyroid, which is of so great a size during life, has been found in some cases simply hypertrophied, in other cases merely enlarged from an increase in the number and size of the blood-vessels. In the same way the eyeballs have become prominent, from the surrounding fat and cellular tissue containing more blood; but in some very chronic cases it has been asserted that there has been a production of new connective tissue.

Virchow has some remarks on this disease in his work on tumours, and in the first place discusses the question as to the priority of its alleged discoverers. He would not with Trousseau style it Graves' disease, thinking that the Germans have an equal right to call it Basedow's disease. Virchow himself styles it "*struma exophthalmica*," and refers to Lebert's scientific title of '*Tachycardia strumosa*.' It may be said that there are authors who claim priority of discovery for Dr. Stokes and Dr. Begbie. In reference to the condition of the organs, Virchow states that the enlargement of the thyroid is due mainly to an enlargement of blood-vessels, especially of the veins, but that it may go on to a fibrous induration. In nearly all cases he found the heart enlarged, the left ventricle being dilated, but the valves sound. As regards the eyes, the prominence is due to a change in the fatty tissues of the orbit, which may be hypertrophied, but generally the orbital structures are merely in a hyperæmic condition.

The fact that such a remarkable combination of symptoms is repeatedly met with, is sufficient to show that there is some special derangement of the animal machinery, and various have been the theories to account for it. There are those who have been content to attribute the whole of the symptoms to anæmia; and this supposition has been supported by the fact, that the complaint is frequently met with in young girls who are suffering from chlorosis. Constantly a patient who at first sight has simply this malady, is found, besides the palpitation of the heart and throbbing in the vessels, to have some enlargement of the thyroid and prominence of eyeballs. Others have thought that a primary affection of the heart might cause the complaint, and no doubt in many cases as a part of the general congestion, there is great fulness of the blood-vessels, prominence of eyeballs, and enlargement of the neck. Such cases

may, however, only tend to show, that whatever promotes undue activity of the heart and engorgement of vessels, whether from too great retention of blood or want of tone in the vessels, is productive of symptoms similar in kind to those witnessed in exophthalmic goitre. Of late years, and more especially since the functions of the sympathetic have been studied, it has been conjectured that the cause is in the nervous system; it has been proved that one of the functions of the sympathetic is vaso-motor, and that a paralysis of the nerve, by removing the tension-force from the arteries, allows them to expand, and thus the part of the body to which they are distributed becomes more vascular and rises in temperature. It is thus conjectured, that if the cervical sympathetic nerves were paralysed, the carotids and their branches would expand, that they would send more blood into such structures as the eye and thyroid, causing them to enlarge, and that at the same time the vessels would throb and the heart palpitate. In confirmation of the view that the disease is really a neurosis of the cervical sympathetic, it has been stated by Trousseau and others that in some dissections the ganglia have undergone an enlargement, or been indurated by inflammation of the cellular tissue around them, and indeed have been virtually destroyed.

If further observations show that the cervical ganglia are invariably involved, the phenomena will be accounted for in some such way as indicated; but at present it must be remembered, that experimental physiologists have shown no results at all comparable with what is observed in exophthalmic goitre after division of the sympathetic. When Bernard irritated that portion of the cord lying between the sixth cervical and fourth dorsal, and which he styled cilio-spinal, he obtained many of the same effects as when he irritated the sympathetic in the neck, a spasm of vessels and contraction of the pupil; on the other hand, a division of the sympathetic produced increased vascularity on that side, with rise of temperature and dilatation of the pupil; but, as far as I am aware, there were not produced any of the phenomena witnessed in exophthalmic goitre; indeed, with so little accuracy do the results of the physiologists appear to be known, that whilst some authors have considered the disease to be due to a paralysis of the sympathetic,

others have spoken of an increased action of this nerve as an explanation for the pulsating vessels, prominent eye, and palpitating heart. Supposing that a paralysis of the sympathetic would account for the dilatation of the vessels in the neck and other phenomena, it would not, according to the experimental physiologists, account for the rapid action of the heart, since they say that a paralysis of the sympathetic would diminish the heart's action, a fact which is corroborated by cases of accidental injury. For example, in a case of fracture of the dorsal spine, I have known the beats of the heart reduced to less than forty, an effect produced through the communications of the spinal nerves with the sympathetic.

Physiologists say, indeed, that the heart is stimulated to action by the sympathetic, and that if this nerve be paralysed the heart would soon cease to beat; this they say may also be brought about by the action of the pneumogastric nerve, which has a regulating or even retarding influence over the heart's action. Thus, to quote Marshall, "In a beheaded criminal electric shocks applied to the pneumogastric nerve suddenly stopped the heart's action, whilst stimulation of the sympathetic re-excited the movements; hence that the vagus exercises an inhibitory action, &c. Galvanism applied to the cervical part of sympathetic, or branch connecting it with the cervical cord, produces remarkable acceleration of the heart's beats. At the same time, when the experiment is performed in the rabbit, it causes dilatation of the blood-vessels, blood accumulates in them and they become dark, and at the same time there is increased temperature with perspiration."¹ Whilst then physiologists maintain that the effects of a destruction of the sympathetic is to paralyse the heart, we cannot assume that such a paralysis has taken place in exophthalmic goitre, where different phenomena obtain; nor, indeed, the opposite opinion that the nerve is over active, for if so it would diminish the calibre of the vessels of the neck and head, and retard the circulation. Whilst, therefore, we may be looking for a nervous cause, we cannot admit in theory that a destruction of the

¹ A remarkable case of a lad was shown to me, by Mr. Cockell, of Dalston, who was accustomed to perspire on one side of the upper part of his body. No cause for it was discoverable, but some months afterwards it was observed that his back was growing out.

sympathetic is that one; if, however, observation shows the contrary, the physiologist must be at fault.

In reference to any other cause productive of want of tone in the vessels being sufficient to account for the symptoms, one cannot but observe the great approach to exophthalmic goitre in many cases of chlorosis; in some young girls this is so marked that it becomes a question as to what is the nature of the malady. Thus, during the last year I have seen three young ladies in whom the difficulty of the diagnosis was very considerable; one young girl had been ill nearly two years; she was anæmic, had short breath, and had all the usual symptoms of chlorosis; the usual remedies, however, had failed to cure her, and she sought further advice. On examining her I found her thin, with some enlargement of the thyroid and violent palpitations of the heart, but no protrusion of the eyeball. I confessed to considerable doubt as to the nature of the case. A very similar one, but more marked, I have quite recently seen. This young lady had been treated as if suffering from ordinary chlorosis, but without effect. She had had amenorrhœa for eight months, had become thin, and had suffered with palpitation. I found her pulse 156 per minute, no bruit in chest, but very loud in the neck; the thyroid enlarged and the eyeballs prominent; the condition of the eyes had been observed by the friends. In this case, although all the ordinary symptoms of chlorosis existed to a casual observer, yet on closer examination they were found to resemble those rather of exophthalmic goitre. The question then arises whether, in speaking of these two affections, we are dealing with two diseases which merely have some symptoms in common, or whether they have pathologically a much closer intimacy. One may observe that in cases of ordinary chlorosis, the patient is often very anæmic, but showing no great loss of flesh, and that a cardiac anæmic bruit exists; in the cases under discussion the patient is thin, not necessarily very pale, and the bruit at base of heart is often wanting; that is, no abnormal sound is produced at the origin of the larger vessels from impoverishment of the blood, whilst local bruits exist in the smaller vessels, as the carotids. The failure of the usual ferruginous remedies also, is a test of the nature of the complaint. Thus a girl of 17, who came to me with amenorrhœa, eyes somewhat prominent and thyroid en-

larged, and with heart beating at rate of 150 per minute, but with no bruit, had obtained no good after three months' treatment by iron. It is remarkable, however, that there should be proneness to the complaint in young girls. Thus a child of 13, whom I have seen several times, and who probably is now dead, had the symptoms in a most marked degree. She was so ill on her first visit to me that she could scarcely walk into my study. She was greatly emaciated; her eyes were starting out of her head, her thyroid was much enlarged, the heart was beating 168 per minute, and there was a most remarkable thrill in the vessels of the neck when the finger was placed upon them. She had also stridulous breathing.

Exophthalmic Goitre. (Reported by Mr. LACEY.)

Charles H—, æt. 26, admitted under Dr. Wilks, October 24th, 1868. His father, mother, and all his brothers and sisters were alive and well; but it was said that an uncle and a brother had suffered from ordinary goitre. The patient had always lived in or near London, and of late years at Dalston, where the New River water is drunk.

Three months since he observed that his throat was growing full, and as it rapidly increased he sought medical aid from Mr. Cockell. Under the administration of Pot. Iodid. gr. v and Tr. Iodi mx internally, and the application of Tr. Iodi locally, the growth was stayed for a time, in fact it slightly decreased. His eyes at this time were observed to be slightly protuberant. The improvement was only temporary, for he soon rapidly grew worse, became very thin, and was often sick; his appetite, however, returned.

On admission he was seen to afford a striking example of the disease; he was extremely emaciated, and so feeble as to be obliged to keep his bed, and to be scarcely able to raise himself into a sitting posture. The wasting appeared to affect more especially the muscles; the temporal muscle was exceedingly atrophied, displaying the malar bones in all their outlines. The muscles of limbs also were extremely atrophied. At the same time his appetite was very good, and at times even voracious, so that whilst he could scarcely support himself on his arm in bed, he would rapidly consume the whole of the dinner

put before him. The most striking features in the case were the enlarged neck and prominent eye, which made his appearance most remarkable. His eyes seemed as if starting out of his head, a large part of the globe being visible. The thyroid formed a large tumour on his neck, projecting more forward than his chin; its division into three lobes was most marked, the left was the largest, the thyroid cartilage still seen above the middle one. The neck measured from top of sternum to Pomum Adami four inches, and around the neck nearly eighteen inches.

The heart was beating 152 per minute, the action regular, no distinct bruit, but the systolic sound was murmurish, and no anæmic bruit to be heard in the chest. In the neck there was a remarkable thrill felt on placing the finger on the blood-vessels, and more especially over the carotids, particularly on the right side; there was also a "bruit de diable," of a most intense character, the sound reminding the listener of the loud roaring of the sea.

He had a slight hacking cough, of a laryngeal character, and voice somewhat husky, as though the thyroid was exerting pressure upon or actually encroaching on the trachea. Respiration natural, rather quick, 28 per minute. The skin was natural, temperature slightly higher than normal, being 99·2; his bowels were regular, appetite good, some thirst.

Dr. Wilks remarked that the experience of all had showed iodine to be of little use, and ordered him good living with eggs and wine, and Mist. Ferri Co., with Sp. Amm. Arom. 3ss, three times a day.

A daily report was taken after a few days. On October 31st he seemed much better. The throat, on measurement, was somewhat less in circumference, the eyes appeared less prominent, and the pulse 130. He had not vomited since he came in. Temp. 99·3.

November 4th.—Appeared still somewhat better, was able to sit up a little in bed, and the enlargement in the neck was somewhat less.

16th.—The last three days had not felt so well, weaker, and appetite not so ravenous, and once or twice vomited his food.

Dr. Wilks said he would try and see if aconite had any

influence over the heart's action, and ordered him Tr. Aconiti, $\mathfrak{m}\nu$ every four hours.

20th.—He continued the treatment until to-day. Sometimes the pulse was as low as 120, and at others 140. He was able to sit up a little, slept well, and expressed himself as better. As, however, it was clear that the aconite was producing no sensible effect, it was ordered that he should return to the iron, taking this time Ferri Tartarati gr. x, Sp. Amm. Arom. $\mathfrak{z}\mathfrak{s}\mathfrak{s}$ three times a day.

30th.—His strength was improving, so that he was able to leave his bed, and walk a little in the ward. Pulse 120, when quiet; measurement around the gland in neck fourteen and a half inches, and from sternum to pomum Adami three and three quarter inches; it felt much harder.

December 20th.—Continued much in the same state until present time; was able to rise and walk about the ward, but did not increase in flesh, for he grew, if possible, thinner; when he was walking about his pulse reached 150, when in bed it once descended as low as 108. On this day he complained of cough, and expectorated some bronchial mucus, also had pain in his right arm, so that he was unable to raise it.

29th.—Since the last date he had been growing worse, the cough was distressing him, and much mucus was brought up tinged with blood. The chest was resonant on percussion, and physical signs gave no other indication than those of bronchial disturbance. The respirations were 40. The heart-beats 140. The cough and expectoration continued. He got weaker and weaker, and died on the 31st.

Post-mortem examination.—*External appearances.*—Oval, straight, sharp-featured face; average height; lightish brown hair, and scanty beard of the same colour; grey iris; the body much wasted, equally so in all parts; the face much sunken, the eyeballs prominent, if compared with those of ordinary dead bodies, yet not strikingly so if compared with those of a living person. The neck measured fifteen and a half inches at its root across the thyroid gland; the fulness caused by the size of this was still remarkable. There was a small bed-sore, commencing over the sacrum. There was a slight degree of anasarca near the ankles.

Head.—Cranial bones of natural thickness, arachnoid and

pia mater thicker than natural on the upper surface; few Pacchionian bodies, arteries natural, grey matter pale, ventricles rather large, posterior cornua closed by adhesion; little venous blood in brain, which was very pale.

Spine.—Membranes all quite healthy, one small plate on the posterior surface of the arachnoid; exterior of medulla spinalis, to naked-eye observation, perfectly natural; it was uniformly rather a soft than a hard cord, but not morbidly so.

Pupils natural size; arcus, none.

Cervical glands small; thymus, none.

Heart.—As the body was exceedingly wasted, the heart should have been small, whereas it was of natural size; thus there was comparative hypertrophy, though the size was not greater than natural. Not any clot in right heart; muscular fibre a little fatty; coronary arteries natural.

Vessels.—The superior thyroid arteries, especially the right, were very large, but only in proportion to the size of the gland. Their coats were very healthy. The veins, too, were much larger than natural, yet they were only proportionately enlarged.

Abdomen.—Partial peritoneal adhesions of the liver and omentum. Stomach contracted. Liver small, healthy-looking, 37 ounces, capsule thin, tissue dark, lobulation indistinct, yet apparently healthy; gall-bladder small—it contained two drachms of yellow bile.

Spleen.—Four and a half ounces, firm, but rather flaccid; Malpighian corpuscles rather less visible than usual; practically a healthy spleen.

Kidneys.—Eleven ounces, dark colour, thin capsule, substance remarkably hard; there was some excess of fibrous tissue in them.

Thyroid.—Large, but retaining its natural form and proportions. The right lobe enlarged upwards, the left downwards, the middle part upwards, the left lobe at its lower end went three quarters of an inch below the upper edge of the sternum into the chest. In this situation it lay so as to bend the trachea to the right; it was packed between this and the pleura; and it lay on the spine posteriorly, touching the left side of the œsophagus for a length of three inches. In this

situation it compressed the thoracic duct, between itself and the top of the lung and spine. From the pressure of the trachea out of its natural shape, it is probable that this compression of the thoracic duct was not insignificant in the causation of the wasting and voracity.

The section of the gland showed its texture coarse looking, but not different from that of a healthy gland, except generally in the larger size of the lobules. At one point in the upper part of the left lobe was a simple cyst of the size of a cherry. The cyst had an opaque wall and softish contents, into which some blood had been extravasated.

The *cervical sympathetic* at its lower part was difficult to dissect, being imbedded in fibrous tissue, to which it was adherent. The middle ganglia were absent, the inferior (on both sides, but especially on the right side) were not grey, as they should be, but quite white, and, instead of being separable, and covered with a thin membrane, they were coated with a dense fibrous tissue that prevented one seeing any grey matter; the upper ganglia, also, were white and opaque looking; the same, however, might be said of the thoracic and abdominal ganglia.

The ganglia were reserved for subsequent examination by Dr. Moxon, who has kindly drawn up for me the following statement of the appearances observed :

"The ganglia were hardened in chromic-acid solution, and fine sections were taken both longitudinally and transversely. These sections were mounted in glycerine, and examined with 1-5th inch objective.

"The ganglionic nerve-cells did not show any morbid condition. The large nucleolus, the large nucleus, and the pigmented patch within the cells, were like those in ordinary sympathetic ganglion-cells. The large size of the cell and the pigment capsules of nucleated substance forming a single layer or coat of smaller cells around the great nerve-cells were also natural.

"The nerve-fibrils passing in bundles through the ganglion were quite normal. *No instance* of granular degeneration could I find in thirteen sections.

"The blood-vessels were permeable throughout and occupied generally with healthy looking blood-corpuscles. It seemed to me that the capillaries were larger than usual.

"The connective substance between the bundles of the nerve-fibres was fibrillar, and, as I believe, was in considerably greater amount than is present in ordinary ganglion-tissue.

"On the other hand, there were no 'granule-cells,' such as we see accompanying so many chronic changes in the substance of nervous centres. And there were no

'colloid' or 'amyloid' corpuscles, such as accompany, generally, those chronic changes (sclerosis) which are not accompanied by 'granule-cells.'

"And thus the microscopic characters of these ganglia, like the macroscopic, only gave us, as signs of disease, an apparent excess of fibrous tissue in the structure of the ganglionic tissue, with an apparent enlargement of the capillary vessels. On the other hand, against this we find the natural minute elements of the ganglion to have a healthy appearance.

"Whether this excess of fibrous tissue be really a diseased state connected with an altered function of the ganglia, or whether it be an unimportant accidental condition in this particular sufferer from exophthalmos, each must judge for himself.

"The presence of an excess of fibrous tissue in the structure of an organ is a common morbid state, and characterises especially those conditions known as cirrhosis. But when a state of cirrhosis exists there is always more or less of another change, viz. the destruction of the functioning elements of the organ, *e.g.* in the liver, of the cells; in the kidney, of the tubes; in the lungs, of the air-vesicles. Now, it is to the destruction of the functioning tissue, rather than to the presence of the excess of fibrous tissue, that the symptoms of cirrhosis are to be ascribed. It is very doubtful whether perfectly formed fibrous tissue, such as exists in these sections of ganglia, would itself be a cause of disturbance. It is complete, and not changing. It amounts to a scar. I am therefore inclined to think that the fibrous tissue in this case is accidental to the real cause of the exophthalmos. This is the more likely, as another observer has discovered a red and swollen state of the ganglia as a cause of exophthalmos. Those who have spent much time in demonstrating anatomy know how much the sympathetic ganglia vary in size and appearance.

"It may, of course, be that these variations are keys to parts of pathology as yet not worked out, and it may equally be that the fibrous state in this case and the swollen state in the other are stages of the same change. But if it be so, we have yet to prove it.

"On the whole, then, I cannot say with confidence that the cervical ganglia in this case were diseased."

Exophthalmic Goitre.

Sarah P—, æt. 36, a widow residing at Reigate, admitted under Dr. Wilks, February 24th, 1869. She stated that six weeks ago her throat began to swell, and at the same time her friends observed that her eyes protruded. She sought medical advice, and was ordered iodide of potassium internally, and tinct. of iodine externally to the throat. She had lately suffered much from palpitation of the heart. On admission, she was seen to present all the usual features of the disease in a moderate degree. The thyroid body was enlarged, measuring three inches across; the eyeballs were markedly protruded, but not excessively so. The heart's action was regular, 125 per minute; no bruit. Murmur in the neck over the blood-vessels. She was ordered Tinct. Ferri Perchlor. $\mathfrak{m}\mathfrak{x}$, Tinct. Digitalis $\mathfrak{m}\mathfrak{x}$, in

water three times a day. At the end of about three weeks she expressed herself as feeling better: the eyes protruded less, and the thyroid was less swollen; the palpitation, however, still existed, and the pulse was much the same. There now appeared a slight systolic bruit over upper part of sternum.

After this and during nearly the whole of the next month she was much worse, owing to the irritability of the stomach, for which bismuth, effervescing, and other usual medicines were prescribed. She would be better for a day or two and then vomit everything she took. In the beginning of May the sickness subsided, the thyroid was much less, and the pulse was often down to 110. At the same time she was very thin and feeble. She left on the 20th, her general state of health not being so good as on admission.

Exophthalmic Goitre. (Reported by Mr. W. T. P. DOUGLAS.)

Jane E—, æt. 39, admitted under Dr. Moxon, September 1st, 1869. Is single, and up to four years ago served as a cook, but was compelled to leave her work in consequence of palpitation of the heart; about the same time her friends noticed that her eyes had become more prominent. For six months previous to the commencement of palpitation, she had suffered with frequent cephalalgia. There is no history of fright.

She has twice been an in-patient of this hospital; on the first occasion, a year ago, in Esther ward under Dr. Habershon; during that time galvanism was used, first to the spine and afterwards locally to the thyroid body. Under this treatment she was relieved. Four months ago she was in a surgical ward for an ulcer on the leg.

Latterly the thyroid gland has increased in size.

She is moderately well nourished, but anæmic; her face has a wild and excited expression, caused principally by the prominence of the eyes.

The thyroid gland is enlarged, the right lobe more so than the left. The circumference of the neck over the centre of the gland is twelve and seven eighths inches. A thrill is communicated to the fingers placed at the side of the swelling, and on auscultation a continuous murmur is heard, together with a bruit synchronous with the beat of the heart.

A blowing systolic murmur is heard over the heart and great vessels, loudest at the sternum in a line with the cartilage of the third rib. There is slight accentuation of the second sound. Pulse 134. Breathing sounds normal; vision occasionally misty; is troubled with sleeplessness; breathing at times difficult; no change of voice; appetite good and at times excessive; no vomiting; tongue clean; bowels regular; no catamenia for two years.

She afterwards came under the care of Dr. Wilks, who ordered her Tinct. Aconiti, which she took for a month. For some days the heart's action was lowered. She is still (Oct., 1869) in the hospital.

CAPILLARY EMBOLISM OR ARTERIAL PYÆMIA.

Did space allow I could report several cases of this disease exemplifying the constitutional symptoms attendant upon the passage of disintegrating fibrin through the system, but I will content myself with reminding the reader of the importance and frequency of the complaint, although it is one which is constantly overlooked. It may be safely said that there has been no more important addition to pathological science than the doctrine of embolism; the facts included in it have been at once recognised by the profession as throwing a light upon cases which before were most obscure. It is remarkable, however, that only one portion of the statements in Dr. Kirkes' paper seems to have been generally apprehended by medical men,—that portion which alludes to the effects of the blocking of a large vessel by a vegetation carried from the heart: such as the plugging of a cerebral vessel, and the attendant paralysis; or the plugging of an artery in a limb, and the consequent gangrene. But there is another, and equally important, part of his paper in which he speaks of the blocking of the smaller vessels in the parenchymatous organs, with constitutional symptoms. The results seen in the organs have long been known and described by Rokitausky under the term capillary phlebitis, but the severe and even fatal symptoms often attendant thereon have not yet been sufficiently recognised. By the term embolism, I say, is generally implied the

case of the blocking of a large vessel and the resulting local symptoms, but under it should be included the equally important and common case of the obstruction of the smaller arteries, with attendant constitutional symptoms. I have for many years been in the habit of insisting upon this both in the post-mortem room and in the wards. Formerly, I was accustomed to show from a strictly pathological point of view how changes occurred in the arterial system analogous to those which take place in the venous:—that as in phlebitis some morbid matters, products of inflammation, being taken up by a vein and carried inwards through the circulation, give rise in the internal organs to depositions of a similar kind in them, so in the arterial system disintegrating fibrin of the blood may be carried from the centre of the circulation to the periphery, and there give rise to further deposits of a like fibrinous matter. Latterly, I have been enabled to show clinically that in both cases there are attendant febrile symptoms with characteristic arthritic pains and occasional rigors; and that just as there is a venous pyæmia having its source on the outside of the body, so there is an arterial pyæmia having its origin within. The term ‘pyæmia’ is, of course, not used in its strict etymological sense; but then it must be remembered, that a rigid application of the word is not required in the more ordinary case of contamination of the venous blood; it is for the objectors to use the term “septicæmia.”

This form of affection, I believe, is far from uncommon, as pointed out in a lecture, of which an extract is given in ‘British Med. Journal’ of March, 1868. That it is overlooked arises from the circumstance that a severe organic disease exists generally at the same time, and that this is considered sufficient to account for the symptoms and death. A patient, for example, is in hospital for valvular disease of the heart arising, perhaps, from rheumatism at some former period; whilst under observation he may have febrile attacks attended by articular pains, but these are regarded as touches of the primary complaint; and when after death the valves are seen covered with vegetations, and the spleen and kidneys full of softening fibrinous masses, these are in no wise regarded as having been instrumental to the fatal event, but as mere accidents of the disease. It must, however, have often, I believe,

occurred to the observer that the derangement of the valvular apparatus was scarcely sufficient to cause death. I can myself recall more than one instance where a patient died several weeks after an endocarditis, and the cause was attributed to heart disease, but where the valves were apparently quite efficient. The cases above all others which afford the most striking examples of arterial pyæmia are those where the endocarditis has left the valves of the heart altogether structurally uninjured, and, therefore, where no mechanical causes resulting from heart derangement can possibly have produced death. Such an instance I mentioned in the lecture above referred to, where a medical man was seized with all the symptoms of pyæmia, in so marked a degree that the only question discussed by his attendants was the probable source of infection. This turned out not to be in the veins at all, but in the arterial system, where the origin of the disintegrating fibrin was found to be an aneurism in the auricle of the heart. Such a case was a simple one of death by arterial pyæmia without any organic lesion. Of course, this constitutional affection may be seen in conjunction with that of local embolism, as in a case I took to the Pathological Society, where a man, besides having in the profunda artery of the leg an embolon threatening gangrene, had articular pains in all the limbs, with febrile symptoms dependent on the circulation of smaller particles of deleterious matter through the system.

The occurrence of fibrinous masses in the solid organs of the body has long been known, and as early as the year 1832 a kidney thus affected is portrayed in these Reports. Rokitsansky described the condition under the name of capillary phlebitis, and states his opinion that it is due to some spontaneous disease of the blood. It was mainly to refute this that Dr. Kirkes published his paper, in which he proved that particles of fibrin were carried to a distance from the heart, where they had previously been formed. This constituted Kirkes' originality. I have, however, never given up the opinion that in many cases the deposit may have occurred from a primary change in the blood itself, since often there is no proof of the existence of a primary endocarditis; in fact, there has been reason to believe that in some cases the deposit found on the valves of the heart has occurred simultaneously with the de-

posits in the solid viscera. It must be admitted that if, on post-mortem examination, there be found associated with these deposits in the viscera some vegetations on the cardiac valves, it would be presumptuous to deny that an endocarditis might have been the origin of the whole train of subsequent events; yet, on the other hand, it would be a practical error not to be awake to the possible occurrence of arterial pyæmia, because there is no history of a primary cardiac affection. For my own part, although Kirkes may be right in the main, I think there is every reason to believe that Rokitansky's statement is equally true, that deposits may occur from changes in the blood itself. Practically I am sure the supposition of such an event will enable us to recognise cases otherwise obscure.

The facts, then, are these — there is the simple case of endocarditis, or the case where vegetations are covering chronically diseased valves, and as a result the deposition of fibrinous material in the capillaries of organs and other parts of the body. In such a case the symptoms and death by arterial pyæmia are, I believe, frequent enough, although not so generally recognised as they should be. I would also insist that, irrespective of a history of a primary heart affection, such symptoms of pyæmia should lead us to a careful examination of the heart in all cases, when the existence of a bruit may at once suggest their true nature. Whether in such a case the vegetations on the valves which are productive of the morbid sound existed previous to the formation of deposits elsewhere, and were the source of them, or whether they occurred simultaneously from a blood-change, is a question often as difficult to decide after death as before it. Then, again, we may meet with cases where the patients present all the symptoms of pyæmia, and where, failing to find any source for the blood infection on the surface of the body to contaminate the venous blood, we may conjecture that the pathological processes are going on in the arterial system, even though we fail to detect any morbid sounds in the heart; for a post-mortem examination sometimes shows that the viscera are affected in the manner above stated, when the interior of the heart is altogether healthy.

One reason I have for believing that in many instances the source of infection is not the carrying away of vegetations

from the heart is, that in the obscurer kind of cases the effects are very slow in developing, whereas in the instances where large portions of fibrin are carried away in the stream of blood the effects are more sudden and momentous. In these chronic cases the disintegration of the fibrin is slower, the smaller vessels in the viscera are occluded, and the organs which suffer are other than those most usually selected in marked heart disease. Thus the spleen not only has isolated masses within it, but the whole organ becomes enlarged by the deposition throughout it. In the same way the liver may be enlarged and hardened, and also the lungs. If in such a case the disease of the blood were due, not to some morbid process originating in the fluid itself, but to a change wrought upon it by the lining membrane of the heart, I should conceive that the latter, although in a sufficiently unhealthy state to be competent to effect this change, was not covered with vegetations, so as to give rise to a bruit, or to account directly for the deposits in the organs by simple transmission. In time, of course, such vegetations might arise, and produce a murmur.

In these cases it is probable that the first symptoms which attract attention will be the constitutional ones, and that febrile symptoms and occasional rigors will suggest the existence of ague; in fact I have seen several cases of pyæmia, both venous and arterial, treated for miasmatic fever. After a short time it is possible that the liver and spleen may be felt enlarged, and still the obscurity remain. At a later period a bruit may be heard, which may be styled aortic or mitral, according to position. The febrile symptoms continue, and the patient, perhaps after a protracted illness, dies; the organs are found affected as described, and vegetations on the valves of the heart. There may be appearances suggesting an old cardiac disease, and accounting for the deposition of fibrin; but it is equally probable that there may be nothing in the heart to indicate an older change than that observable in the solid viscera. I have now seen so many instances of this, both in hospital and private practice, that I recognise them as belonging to a class, although I am often unable to state the origin of the blood change.

That endocarditis with vegetations on the valves is not necessarily a primary affection is seen in the fact that it

may result from an ordinary venous pyæmia; for example, a healthy man may fracture his leg so as to necessitate its amputation; after a time he may have pyæmia, and then an endocarditis. In scarlatina, after the usual recovery, a secondary fever of the nature of a pyæmia is often seen, in which pains in the joints occur, and not unfrequently an endocarditis, so that it is not uncommon for an organic disease of the heart to be traced back to an attack of scarlatina. More than this, in post-mortem examinations of children who have died of this disease, and even before the accession of well-marked pyæmic symptoms, fibrinous masses may be found in the spleen and kidneys.

During the last few years, since my attention has been drawn to the subject, I have seen many instances of arterial pyæmia, and my mind reverts to cases occurring at an earlier period, and not at all explicable by the pathological doctrines of that day. In a paper on Pyæmia in Vol. 7 of the present series of these Reports, I relate a few cases where there was no evidence that endocarditis was the primary affection. One was the case of a man who was admitted after discharge from prison; he was extremely low and depressed, and thought to be suffering from fever. He shortly died, when the viscera were found full of masses of softening fibrin, and a vegetation existed on an aortic valve, but when this was removed the endocardium showed no evidence of inflammation. Another case of Dr. Habershon's, which had previously been reported by him in Vol. 5, was that of a woman in a state of extreme poverty. Being very ill she was sent to the hospital as a case of fever; the febrile symptoms were high, the tongue brown, the pulse quick, and there were daily rigors, followed by heat and sweating; no cardiac bruit could be heard. She remained exceedingly ill, and was in that state which is usually called typhoid, when some blebs came out on the skin, and she had pains in all the joints and the rigors continued. On the third day after admission a systolic murmur was heard, she gradually grew more prostrate, became delirious and died. On post-mortem examination the spleen and kidneys were found full of softening masses of fibrin, and there was a slight roughness on the border of the mitral valve, as if vegetations might have once existed there. In some cases, as I have said, the liver and spleen may

be enlarged, and thus the observer's whole attention may be given to the abdomen. I well remember how such a case, when I was a pupil, puzzled Dr. Addison. A woman for three months had had fever with rigors, supposed to be ague, and, with this, enlargement of the liver and spleen. After death the heart was found diseased, although no evidence was given of it during life. In looking through the '*Transactions of the Pathological Society*,' I have no doubt that several cases of enlarged spleen were of the nature indicated, and as early as the year 1851, about the time when Dr. Kirkes was engaged in his researches, a case was brought to the Society by Dr. Hare of a young man, æt. 25, who gave as his history that he took cold six weeks before, and that this was followed by pains in the joints, palpitation, and enlargement of the abdomen. When under care he had a large liver, a large spleen, and albuminous urine; also œdema of the ankles, and a double murmur over the cardiac valves. After death there were found vegetations on the aortic and mitral valves; the spleen and kidneys were much enlarged, hard, elastic, with a yellowish deposit.

I would say, therefore, that arterial pyæmia is a by no means uncommon affection, and that it is seen frequently in chronic heart disease; but the symptoms are overshadowed by the more severe ones attendant on the valvular imperfection, or, if observed, regarded merely as rheumatic. Also, that it may be often met with where there is no history of a primary heart affection, although an endocarditis at the time of the occurrence of the symptoms may exist. Also that it should be suspected in cases of obscure febrile conditions, especially if accompanied by rigors, and more especially where the liver and spleen have been found to be slowly increasing in size.

GENERAL CHRONIC ARTERITIS.

The following case is offered as a contribution to the subject of arterial disease, a form of malady sufficiently rare to warrant a detailed report. It will be seen that some of the principal arteries in the body were so thickened and obstructed that the term arteritis might correctly be applied to the disease. The great point of interest lies in its cause, in the question why, at a particular time, the arterial system should have commenced

to undergo this change? We naturally suppose the cause to be a general or constitutional one, and thus we reflect necessarily on such diseases as gout, rheumatism, or syphilis, as possibly instrumental in its production. As regards the latter there can be no doubt that the blood-vessels may be affected by the gummatous change, like all other tissues in the body, but in the present case there was no evidence that the patient had ever suffered from the malady. As regards rheumatism, it is an interesting question whether a general arteritis is ever associated with an endocarditis, leaving out the minor question as to whether the serous membrane or the blood is the part which is primarily affected. There are certain facts, such as the occurrence of aneurisms in young persons who have had acute rheumatism, which would encourage the idea of the whole circulating system being sometimes affected in this disease.

CASE.—Joseph J. P—, æt. 38, a cheesemonger, married, and leading a regular life. I was asked to see this man not far from the hospital by Mr. Rendle, on Sept. 8th, 1868. I found him lying in bed excessively ill, complaining of great pain in his limbs, apparently due to some arterial disease. His right hand was cold, and some of the fingers were quite white, and in the condition usually styled dead. I immediately felt for the pulse, but could discern none. I then proceeded to look to the arteries in the body, and was surprised to find the pulsation either extremely feeble or almost deficient. The heart's action was tumultuous, and gave the impression of an organ that was not quite healthy, but no actual bruit was discoverable. On inquiring into the history, and especially as to an attack of rheumatic fever, I could only learn that about five years before he had an illness resembling typhoid fever, which left him with some contraction of the hamstring muscles. He was, however, able to follow a laborious business until about fourteen weeks ago, when he became ill and weak, with violent pains all over him, sometimes in the limbs, sometimes in the chest or abdomen. He was also often sick, and had a cough. After I saw him he got sufficiently better to resume work; but at the end of two months from this time, becoming again worse, he was admitted into the hospital on November 3rd, 1868.

He was then too ill to sit up, was very thin, and complained of pains all over him, especially in the legs. These pains he described as being of the most excruciating character, as running down the limbs, and entirely preventing him sleeping. His feet and hands were warm; but on examination of the arteries, no radial pulse could be felt on the right side; on the left side it was slight. Pulsation in the femoral arteries could sometimes not be felt, at other times very obscurely; the carotid could only be felt beating with the greatest difficulty. The heart was beating quickly and irregularly, and gave the idea of a dilated organ. Its pulsations numbered from 150 to 200. At base of lung some signs of consolidation existed, and there was expectoration of some bloody mucus. There was also some albumen in the urine. The ankles slightly œdematous, the temperature of right hand rather less than that of left.

Considering that mere feebleness of circulation arising from weakness of the heart was not sufficient to account for the symptoms, I believed that the man was suffering from a chronic arteritis, that the vessels were becoming blocked, and the pains in the limbs were thus caused. Soon after admission his appetite improved; he slept better, and he consequently expressed himself as feeling stronger than he had done for some time.

At the end of November he again became worse; the pains in the legs, especially in the left, having become more severe. These were worse of a night, and often obliged the sister of the ward to send for the House-physician. The patient would suddenly wake out of sleep and utter a cry in an almost hysterical manner, and complain bitterly of the awful pains in his limbs; although the legs pained him, they felt numbed or dead. This occurred on several nights, so that Mr. R. Stocker was obliged to administer morphia by subcutaneous injection, after having tried nitrite of amyle and other remedies in vain. As a rule, when the arterial system was examined, no pulsation in the right radial artery could be distinguished, very slight pulsation in the left radial, no pulsation in the left femoral, very slight in the right, none in the tibials, very slight in the carotids. Moving the legs generally aggravated the pain.

During the whole of December and January he remained in bed, and his symptoms were much the same; the pains in the limbs were his great trouble, and to relieve these he had morphia injections. In the beginning of February his appetite failed, and he had frequent sickness; after this he gradually sank, and died on the 13th.

Post-mortem Examination.—External Appearances.—Body rather spare; no dropsy; complexion yellowish; bluish purple coloration of dependent half of body, patched on the sides and abdomen also.

Head.—No nodes; bones of average thickness; arachnoid and pia-mater natural; grey matter of sulcus between second and third left frontal convolutions was in a state of yellow atrophy for the space of half a square inch; about three inches in a line behind this there was a recent softening in the grey matter, also another small one in the grey matter of the right posterior lobe. The deep parts were quite healthy and firm; little venous blood in brain.

Chest.—Costal cartilages ossified; a good deal of adhesion about the bases of the lungs on each side, chiefly at the left side; the lungs generally contracted well and appeared healthy, but at the base of the left was a small cavity of size to hold a small chesnut; about this was a puckered shrunken state which had affected a good deal of the tissue, so that the lower lobe was on this account small.

Heart.—Weight about 16 ounces approximately; hypertrophy not equal to the dilatation; dilatation chiefly of the left ventricle; right side, black loose clot in all cavities; left side, black loose clots; no disease of the right side and no ante-mortem clots. Mitral valve slightly inflamed at its edge. Ventricle, its lower and hinder part, and in less degree the posterior set of muscoli papillares, were in a state of fibroid degeneration, *i. e.* shrunken and converted into a fibrous tissue. The ventricular surface of this tissue was thick, hard, and callous to the depth of about one sixth of an inch or less, varying with the col. carneæ, which were chiefly affected; outside the fibrous layer the tissue sank in the section from being slack; it was also vascular and congested, so as to have somewhat the appearance of cavernous tissue. Here the affected part was tolerably well defined, and had yielded a little, so as to form an aneurism of the heart to

a low degree. The septum had some fibrous patches up its inner face.

Arterial System.—The aorta and arteries of the neck and axilla were about average specimens; they were not perfect, but were elastic and smooth and of natural colour, only flecked and patched here and there with superficial atheromatous degeneration. The right brachial artery was permeable as far as the ulnar, but here it became suddenly occluded, while the rest of the ulnar artery was quite closed up, and reduced to a fibrous cord, in the interior of which a solid cord of the size of a common pin—a mere thread—was present, and fastened to the walls; the artery was thus wholly obsolete.

The right common iliac, and external and internal iliac, arteries were entirely full of old adherent brown clot, so closely adherent that the wall of the vessel would split rather than part from the clot. There was, at the bifurcation of the femoral, a gap in the continuity of the clot; it ended above the bifurcation and began again below the origin of the profunda; and at both the ending and commencing parts the clot was white, and like fibrous tissue, and could not be distinguished from the coats, which here were swollen and atheromatous; the atheroma, indeed, appeared to be here in the clot also, as well as in the arterial coat. This part was narrower than the rest of the vessel. The dorsal arteries of the feet were empty and small, but free in channel; the left femoral was full of clot of the same appearance as that on the right side, from Poupart's ligament downwards, and the lower end of the clot, as on the other side, was abrupt, and seemed to be older, being fibrous and inseparably adherent, and apparently containing atheroma in it. The right femoral vein was also occupied by ante-mortem clot, and its tributaries had firm clots in them.

Abdomen.—Stomach, red within; no p. m. solution; duodenum pink; no ulcers in large intestine; liver 60 oz., thin capsule; structure natural, ramosely injected; half ounce of bile of dark colour in gall bladder. Pancreas healthy. Spleen 3 oz., rather hard, no Malp. corp. There were the signs of a very old embolic patch in it. Supra-renal capsules healthy. Kidneys 10 oz.; natural; the left had in it two large rather old embolic patches, sunken and yellow; also another, out of date, as a deep fibrous scar. Bladder and testes healthy.

A somewhat similar case was in the hospital some years ago under Dr. Barlow, and the patient afterwards dying in St. Bartholomew's, an account of it was published by Mr. Savory in the 'Med.-Chir. Transactions' for the year 1856.

The girl was 22 years of age at the time of her death, and for several years previously had been in delicate health, but there was no history of her ever having suffered from a definite illness. She complained of general weakness, tremors, and pains in the limbs. No pulse could be felt in either arm, there was only a feeble pulsation in the right carotid, and a very doubtful one in the left. She subsequently had necrosis of the parietal bone, and the brain becoming involved, she died with cerebral symptoms. On post-mortem examination the aorta throughout its length, as well as the vessels to the lower extremities, were healthy, but those given off to the head and upper extremities were remarkably diseased. They were extremely thickened, and in some parts obliterated; where this was the case, a slender hard fibrous cord occupied the vessel, and was adherent to it. The thickening was due to the formation of a new connective tissue between the inner and middle coats; this existed in some places as a hard, yellow deposit. This change extended from the innominate artery along all the main vessels of the arm, and along the carotids.

THE ASSOCIATION OF GOUT WITH PLUMBISM.

It has long been observed, according to Garrod in his work 'on Rheumatism and Gout,' that workers in lead are very prone to gout. The association of this disease with such an accidental occurrence as the absorption of lead is so remarkable and so little in accord with what is positively known of the effects of plumbism on the one hand, or the causes of gout on the other, that the fact has been received with incredulity by some, and dismissed at once from their attention by others. Thus, when I have alluded to the circumstance, I have constantly heard it ignored as resting only on an imaginary basis, or what is more usual the observation had not until then been heard of; I therefore make reference to it not with the hope of being able to throw any more light on so obscure a sub-

ject, but simply to endorse by my own experience the statement of those who have long observed an intimate connection between this constitutional disease and lead poisoning. I add, by way of report, two or three cases, but I should have had no difficulty in finding a dozen to confirm the fact. I also allude to it to remark that not only does it appear that persons affected with plumbism are liable to gout, but that they are the subjects of the same pathological changes in the various tissues of the body as occur in sufferers from the latter disease. Thus we see degeneration in the blood-vessels, and a liability to granular disease of the kidneys, as in gouty persons. These facts make the subject one of great interest, and one of larger pathological bearing than the association would at first suggest. For example, if gout be due mainly to hereditary predisposition, we should be forced to admit that the connection of this disease with plumbism is due simply to the increased susceptibility of gouty persons to the mineral, and be forced to the conclusion that lead exerts its deleterious influence only on certain constitutions ; whilst in others, of course, it is inert. If, on the other hand, besides considering the influence of hereditary taint, gout is immediately set up by a mal-assimilation which is productive of an excess of uric acid, we should be obliged to admit that not only may want of bodily exercise, and the imbibition of malt liquors and wine be instrumental in this result, but that other agencies may be at work, and amongst these the action of lead. Supposing that this metal, like some other causes, acts by interfering with assimilating processes, and so leading to the formation of excess of uric acid, we may then account for the ordinary arthritic symptoms, diseased kidney, and other morbid conditions. For it may be remarked that the direct effects of lead on the system are not the same as those seen where gout has intervened. Lead simply tends to deteriorate the tissues ; the muscles waste ; the cerebro-spinal system also atrophies, and the patient becomes cachectic and utterly enfeebled in mind and body.

The well known treatise of Tanquerel des Planches makes no mention of gout, or indeed of any affection of the joints, as a consequence of lead poisoning. He devotes a chapter to saturnine arthralgia, but he intends by this expression to refer

merely to pains in the limbs (*douleurs névralgiques des membres*), which so frequently accompany other symptoms of plumbism. Tanquerel dwells mainly on the effects of lead on the nervous system; and these, indeed, have always been the best observed symptoms from the time of the ancients; tremors, convulsions, and epilepsy having been noted by Hippocrates and Aretæus. In modern times it has been suggested whether the last named symptoms were due to the kidney, and were, in fact, uræmic; to test this question Dr. Rosenstein (*Virchow's 'Archiv'*) performed experiments on dogs by administering to them small doses of acetate of lead, and he found that they soon had convulsions, but in no instance did he find albuminuria, or kidney disease.

In the cases, however, alluded to, where gout has been developed, the tendency to pathological changes has been the same as in true gout. In the example which immediately follows, the combination of effects will be seen.

(Reported by Mr. W. A. Marsh).

CASE.—Edward C—, æt. 44, living at Rotherhithe, admitted under Dr. Wilks, December 2nd, 1868. His occupation was that of a colour grinder, and at this he had been engaged for sixteen years. He was of steady habits. His family history was good. During the time above mentioned, he had suffered from lead poisoning, principally from colic, on six different occasions, and on one he had what he believed to be rheumatic fever. About two years ago he was under Dr. Wilks for dropped wrist, and it was then observed that his muscles were undergoing a progressive muscular atrophy. It appeared that about seven years before his last admission, his hands became affected and became gradually weaker since. He continued on, however, when five weeks ago his legs and abdomen became swollen, and thus eleven days before admission he was obliged to desist.

On admission, he was extremely weak; he could scarcely raise his arms from his side owing to the attenuation of the muscles, those of the forearms and hands being principally affected; the interossei being almost gone, and the fingers flexed on themselves. He had a blue line on the gums. The abdo-

men was enlarged, and fluctuated on percussion, the legs and scrotum were also œdematous. The edge of the liver could be felt below the ribs; the breathing was oppressed, and there was much bronchial expectoration. The heart appeared healthy, no bruit being discernible, and the urine was carefully examined without finding any albumen.

There was a long and daily report taken of this case, but it contained nothing of importance to point to the cause of this man's extreme distress and feebleness. The abdomen became more distended and tender, and the breathing much embarrassed; it is probable that the respiratory muscles had somewhat degenerated, and thus the difficulty of breathing which could not be accounted for from disease of the viscera. His hands were now so feeble that he could grasp nothing, and thus could not make use of his upper extremities to assist him in breathing. At the end of January he was tapped, and much relieved by the operation. He afterwards again became much oppressed in breathing, and on February 8th was obliged to leave his bed and sit constantly in a chair. Nearly every day he had paroxysms of difficult breathing, due apparently to want of muscular power. After a time he was unable to sit for any lengthened period, and for some days before his death spent many hours of the day standing. He died at last, February 27th, 1869.

Post-mortem.—*External appearance.*—Flat, square-oval face, with long, irregular features; body very spare—indeed, wasted; slightly sallow complexion; considerable dropsy of the lower extremities, much of the abdomen. A small sore beside the buttock, also another small deep ulcer in the right lumbar region. No scar of syphilitic bubo.

Head.—Cranial bones natural, arachnoid and pia mater not thick, cerebrum rather tough and slack, no signs of old apoplexy, little venous blood in brain.

Chest.—Costal cartilages very much ossified, so that the saw had to be used. Acute recent pleurisy; the usual transversely ridged appearance of the lymph, which was in small quantity. Both pleuræ showed old thickening over the lower lobes, contracting the substance of the lung; there were extensive effusions in both cavities.

The lungs were healthy in texture, except for the com-

pression of the lower lobes; the bronchia were full of pus, of watery appearance, with some froth.

Larynx.—Quite healthy. Cartilages converted into bone.

Heart.—Twenty-one ounces, very much hypertrophied and dilated enough to have held a common left ventricle; no change in pericardium; right side of heart contained tough fibrin in small quantity; left side contained black loose clot; left auricle thick; mitral valve a little thick at the edge, the valve was, however, competent, as tested by tying the aorta and filling the ventricle; aortic valves natural, muscular fibre healthy; coronary arteries thick; all the arteries thick in upper limb.

Pharynx.—Right tonsil hypertrophied; on section it was throughout indurated by fibrous tissue in quantity,—cirrhosis of the tonsil. The left was less affected.

Abdomen.—The peritoneum everywhere thick, and contracted on the viscera; a layer as thick as a sixpence could be raised from the flanks, and left an apparent peritoneum still present on the surface.

Stomach intensely reddened, and coated with a tenacious mucus.

Small intestine as deeply red as the stomach, and in parts ecchymosed, the surface coated with starchy mucus, of yellow colour, much less glairy than that in the stomach. The same state extended through the colon. No ulcers anywhere present.

Liver, 48 oz., rounded in form; the capsule coated with a thick false membrane, with the usual areolated appearance; in front, the false membrane had so shrunk down upon and compressed the liver, that on removing it, the edges of the organ were revealed, folded back most curiously, like leaves folded in a bud.

The gall bladder, also, which was flattened down by the false membrane, on the removal of the thick layer, came up to its natural size and position; it was without gallstones.

Mesenteric glands rather large. Lumbar glands twice the natural size. Spleen, 5 oz.; its capsule moderately thickened, in parts the substance had more fibre than natural, no malformation; corpuscles visible.

Supra-renal capsules healthy; much fat in cortex.

Sympathetic nerve appeared quite healthy. It was white

and large, and connected to parts around by loose connective tissue.

Urinary Organs.—Kidney, 7 oz., dark, finely mingled colour. Cortex wasted; no appearance of structure; some small cysts. Pyramids usual size; many urate of soda grains. Bladder compressed by the thick peritoneum; a small cyst just in place of middle lobe of prostate; the muscular layer was far thicker than natural, to overcome the resistance of the thick peritoneum. Testes both healthy.

Upper Limbs.—The extensor muscles changed to fibrous tissue, of slack consistency and watery appearance; no increase of, or change in, the surrounding atmosphere of cellulosity, which was delicate as usual. The supin. brevis, and the deep extensors, were most diseased; the ex. carp. rad. brev. also very bad, the superficial extensors too, but the ext. minimi digiti less so; the nerves did not appear to be changed, and certainly were very perfect, compared with the muscles; the pronator teres was much changed, and where it adjoins the supin. brevis. The flex. subl. dig. was also changed by a band of fibrosity crossing it at its middle. Under the microscope, the muscles appeared quite converted to fibrous tissue. Gouty deposit in both great-toe-joints, to moderate extent, especially in the synovial membranes, and in the parts corresponding to the sesamoid bones.

CASE.—William M—, æt. 44, admitted into Philip Ward under Dr. Wilks, April 2nd, died April 20th, 1868. He had worked in lead, and had a blue line on the gums. Married. Ill health commenced with gout nine years ago; he had usually three attacks a year. Had never been accustomed to drink much. While in hospital seemed often confused and unable to answer questions coherently. Was pale, and skin waxy. Conjunctivæ were watery; tongue furred; first sound of heart distant. Complained of fixed pain across abdomen. Had a discharge from urethra, rendering micturition difficult and painful; urine albuminous, sp. gr. 10·11. He expectorated a dark, bloody sputum, and was very restless at night. Gout was painful in both feet, afterwards in right wrist. On April 13th he had a well-marked pericardial rub, audible anteriorly and posteriorly. On the 14th he became delirious at night.

On the 18th became very delirious, constantly moving with choreiform movements, for about twenty-four hours before death.

Post-mortem examination.—Good development, nourishment moderate, complexion fair, red hair, very little dropsy of legs, cranial bones rather thick, otherwise healthy; dura mater tough, arachnoid opaque, cerebrum appeared healthy, ventricles of brain had some granules on septum lucidum, very little venous blood in brain, membranes of spinal cord as those of brain, excepting pia mater, which was very much congested. The spinal cord itself contained a spot of ecchymosis in its centre, and the grey matter was much congested, the capillaries being beautifully injected; right lung very œdematous, left bronchus very œdematous, weight of heart twenty-five ounces, left heart very much hypertrophied, right not so much as left, pericardium covered with recent lymph, very little clot in right side of heart, the right auricle dilated, the ventricle dilated and hypertrophied, left side of heart very little clot, left auricle dilated, as well as ventricle very greatly hypertrophied, valves of heart quite healthy, aorta (ascending) not good, loss of elasticity; spleen healthy, weight of kidney six ounces, which was small and granular; the cortex almost all gone, joints of lower limbs filled with gouty concretion.

CASE.—John W—, æt. 48, admitted under Dr. Wilks, February 3rd, 1869. He was an engineer on the South-Western Railway, and worked in lead. He was a temperate man, and there was no hereditary history of gout. For a long time past he had been troubled with what he called rheumatism, which at last obliged him to give up work.

He was a cachectic-looking man, as if he had suffered long from illness; on his right elbow an inflamed bursa, which contained some deposit of urate of soda. Over the metacarpo-phalangeal joint of fore finger is an ulcer, in which is a quantity of mortar-like stuff. His wrist and hip also swollen and tender. Over patella of left knee-joint is also a deposit. A deposit of urate of soda in auricle of right ear. He was in the hospital about six weeks, and got much better. He took during the whole time the Tr. Ferri t. d., and a dose of lithia in the morning.

DESCRIPTION OF PLATE

Illustrating Dr. Wilks' Paper.

This plate represents the appearance of the patient Charles H—, suffering from Exophthalmic Goitre, whose case is recorded on page 22. The drawing has been carefully copied from a photograph.



STATISTICS OF SUBCLAVIAN ANEURISM.

By ALFRED POLAND.

I FELT some diffidence in complying with the suggestion of the editors of the 'Guy's Hospital Reports,' that they might publish the following article on the statistics of subclavian aneurism, because in the first place it seemed to me that such an article would be out of place in a journal of this kind, inasmuch as it could contain but little reference to cases in the Hospital; and, secondly, because the article had been presented to the Royal Medical and Chirurgical Society as an appendix to a 'Paper on Fusiform Aneurism of the Subclavian Artery,' but was deemed by the Council too lengthy a communication for their 'Transactions.' However, I have for several reasons ventured to comply with the suggestion made to me. I may state that it was entirely owing to my having had a case of subclavian aneurism under my care in the wards of Guy's Hospital, that my attention was directed to the subject. I found that the cases of the kind were scattered about in the varied periodicals and works of surgery, and that the whole question of treatment was vague and unsatisfactory. I thought, therefore, that by collecting these cases together, some satisfactory results might be obtained. The case itself, and the statistics, were ready for the last volume of the 'Reports,' but were not offered to the editors in time for insertion. However, it was exceedingly fortunate that the delay occurred, for when Langenbeck's 'Archiv'*

* Langenbeck's 'Archiv für klinische Chirurgie,' Bd. 10, Heft i; Dr. W. Koch, "Ueber Unterbindungen und Aneurismen der Art. Subclavia," p. 195.

for the first quarter of 1869 appeared, in the spring of that year, it contained an elaborate statistical paper on 'Ligature of the Subclavian Artery, and on Subclavian Aneurisms,' by Koch. This essay was of such gigantic proportions, and appeared to be so vast and exhaustive of the subject, that I considered my humble endeavours as totally forestalled and eclipsed, and any further publication thereof as only a work of supererogation. However, on carefully perusing this enormous collection, I found several inaccuracies, and of such a nature as to render the statistical deductions not quite correct; and again, I learnt that the course and extent of the subclavian artery had been altered to lower down, and made to terminate at the inferior border of the pectoralis minor muscle, thus letting into the collection wounds and aneurisms of the axillary artery, although I must myself plead guilty to having partly erred on this point, as I shall explain immediately. Koch has also included wounds and diseases quite independent of aneurism; and, in fact, his tables embrace every possible complaint for which ligature of the subclavian artery has been performed. It is true, in the latter part of the collection, he has placed together what he terms "true subclavian aneurisms," which of course come more to the point aimed at; yet even here several inaccuracies have crept in. Notwithstanding, however, these little defects, much information has been derived and several fresh cases found recorded, which had been omitted by me, and several important suggestions and deductions have been derived. These I have necessarily made use of pretty freely, so as to ensure as perfect a collection as it is possible to devise. Thus then I reconstructed my statistics, and deferred their publication to a later moment. However, in reviewing my case, I found it to possess so many points of interest, and peculiarities of unfrequent occurrence, that I developed it into a paper, making my statistics an appendix, and in this form I offered the whole to the Royal Medical and Chirurgical Society, which accepted it; but on account of its great length, the paper only was read and ordered to be printed in the 'Transactions,' while the appendix containing the statistics was returned to me. It is this appendix that now appears in the 'Guy's Hospital Reports,' for which it was originally intended.

Although subclavian aneurisms have received but little con-

sideration in consequence of their supposed rarity, yet on a more careful investigation, a very rich supply of cases may be gathered from the various medical journals in this and other countries. These cases of aneurism are most interesting, and offer abundant materials for inquiry, more especially on the subject of their treatment. Almost every form of treatment has been adopted, and it is with the object of ascertaining the best and safest method for their cure that the present statistics have been collected.

Of recent years the subject has been taken up by several writers, but there is one American observer, Dr. Sabine, of Philadelphia, who has published a most valuable and interesting communication in the '*American Medical Times*' for 1864; and more especially in reference to the operation of ligature, for which he is a strong advocate.

The present collection has, of course, been a work of some little labour, in consequence of the difficulty in referring quoted cases to the original source and authentic publication. In almost every instance this has been carried out most fully, so that complete reliance may be placed upon the accuracy of each case; and, moreover, the reference and source of supply are amply expressed, so that any individual case may be referred to for further detail. In cases of difficulty and obscurity, where details were not published, personal and written communications had to be made, and for the frankness and courtesy shown in assisting me in my endeavours, I cannot but express my sincere thanks. Among all my applications I have only met with refusal in one instance; but this one is especially to be regretted inasmuch as two excellent cases, although fatal, are lost to record and to instruction, in consequence of the unwillingness on the part of the surgeon to allow his case and that of another deceased surgeon to appear in public print.

Some explanation is, perhaps, necessary to account for apparent discrepancies existing in the tables, as compared with those of Koch and other authors. These are mainly due to the different views taken respecting the lower limit of the subclavian artery. This has always been a matter of uncertainty; as to whether the limit should be the clavicle, the first rib, or the border of the pectoralis minor. Koch has taken for his limit the lower border of the pectoralis minor; Bichat, and

some of the older surgeons of the French school, considered the axillary artery to commence at the outer border of the scalenus anticus; Cruveilhier and others insist upon the clavicle as the line of demarcation between the two great trunks; some of the Italian writers speak of ligature of the axillary artery above the clavicle, and others again of ligature of the subclavian artery below the clavicle. Lastly, the limit has been placed at the lower margin of the first rib, and this has been, for the most part, adopted by British surgeons, and it has this advantage, that it is a more fixed limit than the other boundaries, and this I have adopted in the present instance.

Another apparent anomaly in this collection is the presence of several cases of axillary aneurism which are found in other collections, more especially in Le Fort's article on the axillary artery in the 'Dict. des Sciences Médicales,' and tabulated by him accordingly; but although the disease had probably commenced in the axillary artery, yet in fourteen of these cases the subclavian artery had become involved, and the disease had encroached upon its domain, rendering the operation of ligature of the third portion highly dangerous and difficult, and considerably increasing the mortality. This class of cases I have chosen to include in my tables, and have, for distinction, termed it subclavio-axillary aneurism. Some, no doubt, were originally axillary, extending above the clavicle, and others undoubtedly subclavian, extending downwards into the axilla and on to the chest. One or two of these I should have considered purely axillary, but such high authorities as Porter, Wishart, Gregg, &c., having pronounced their cases to be subclavian, I have necessarily retained them as such.

It would appear that the subclavian artery may become affected in the several following ways:

A. Aneurism involving the artery alone, and affecting—

1. The internal portion.
2. The middle portion,—a thing almost impossible *per se*.
3. The external portion.

B. Aneurism of the subclavian with its continuous main trunks—

1. Combined with the axillary—subclavio-axillary.
2. „ „ innominate.
3. „ „ carotid, as seen in cases 106 and 107.

We must bear in mind that an aneurism below the clavicle is not necessarily axillary; the lower confine of the subclavian at the inferior margin of the first rib is below the level of the clavicle, and is a point of the artery where aneurism is most likely to form, and this no doubt would be found the source or origin of the disease in many cases, if carefully looked for; now, if the aneurism should ascend above the clavicle, it would be called subclavian, but if below, occupying the axillary and thoracic regions, it would be called axillary, although really subclavian. Again, the clavicle and shoulder may be thrust upwards, rendering the disease still more apparently axillary in character.

I have excluded all wounds of the artery with the exception of two, which are not numbered in the tables, but merely have asterisks affixed; they are true specimens of traumatic aneurism, and are placed here as bearing on the mode of treatment by ligature or otherwise (see cases of Bonnet, Cullerier). The tables are arranged according to the treatment pursued, and the case only once mentioned under the heading of the treatment last adopted, although in many instances various measures had been resorted to. The headings comprise the side, whether right or left; the sex, age, occupation, &c., and supposed cause; the duration and size of the aneurism when first observed by the narrator; the condition of the limb; the character and peculiarities of the disease; the treatment adopted; the secondary effects, result, and cause of death, with accurate references to the works and journals.

A second set of tables comprise the essential points manifested after death, including the condition of the sac and artery and parts around; the condition of the proximal and distal ends of the artery after ligature; and the condition of the arterial system in general.

In order to be as precise as possible, I have deemed it necessary to preface the tables with a brief abstract of those

cases which have been considered as axillary aneurisms, but which I have regarded as subclavio-axillary aneurisms, inasmuch as their introduction has an important bearing on the treatment of operation by ligature.

No. 10. *Colles*.—The axillary aneurism involved the third portion of the subclavian artery, so that it was no longer distinguishable from the coats of the tumour, and Mr. Colles proposed ligature of the first portion of the artery in consequence.

No. 18. *Guthrie*.—When first seen at the London Hospital, it was pronounced to be aneurism of the subclavian artery becoming axillary, the tumour being immediately behind the clavicle.

No. 22. *Wardell*.—The aneurism commenced immediately below the middle third of clavicle, and the abnormal pulsation could be felt powerfully beating along the vessel to the sterno-clavicular articulation. "Frémissement" was very perceptible, and a distinct bruit heard with the second sound.

No. 38. *Yeatman*.—The tumour lay on the left side at the root of the neck, just above the superior edge of the clavicle.

No. 43. *Pencoast*.—The patient first observed the swelling at the root of the neck, just above the clavicle; it afterwards extended downwards.

No. 44. *Dupuytren*.—The tumour appeared in the right axilla, elevating the clavicle. On careful examination two tumours could be discovered, one situated below the clavicle, and the other larger one occupying the axilla. After death the upper one was found to be formed by the subclavian artery dilated for the extent of two inches.

No. 46. *Lawrence*.—In the earlier period of the case the tumour was seated behind the clavicle, so that it was impossible to tie the subclavian artery external to the scalenus, and therefore the innominata was selected for the proposed operation, which, however, was not performed.

No. 61. *Cooper, Sir A.*—Mott, who witnessed the operation, describes the aneurism to have been subclavian; and, moreover, Sir A. Cooper saw the case when the tumour was small, and considered it to be subclavian.

No. 64. *Hoffman and Post*.—The same case, although described by each independently. There were two distinct sacs, one subclavian and the other axillary.

No. 65. *Cusack*.—The case is described by him as a diffused aneurism of the subclavian, the sac having burst into the axilla.

No. 66. *Lawrence*.—In a private case he attempted to tie the subclavian artery for a supposed axillary aneurism, but failed in consequence of the extension of a small pouch just at the situation where the ligature should have been applied.

No. 68. *Colles*.—In the post-mortem examination it was found that the aneurismal tumour had extended more in length than in breadth, and had ascended so high as to have reached near to the spot at which the ligature had been applied.

No. 69. *Travers*.—The ligature was applied at the outer edge of the scalenus, and close to the root of the sac. The sac had a pouch-like enlargement upwards, which closely overlaid the artery.

No. 70. *Brodie*.—In applying the ligature close to the scalenus, the subclavian artery was found dilated to nearly twice its natural size, &c. &c.

No. 71. *Auchinloss*.—Tumour extended in the course of the subclavian artery becoming axillary, from the outer margin of the scalenus to the middle of the lower third of the axillary.

No. 72. *Stey*.—Aneurism above the clavicle.

No. 73. *B. B. Cooper*.—Tumour protruded forwards, displacing clavicle, and rose up in the neck considerably, and so called subclavian.

No. 74. *Blaker*.—There was not more than one quarter of an inch of artery undilated between the sac and the spot where the ligature was applied.

No. 75. *Paget*.—An aneurism was found above and one below the clavicle; the one above about the size of an orange, and the other below about that of two fists.

Nos. 76 and 77. *Nicholls* and *Green*, both subclavian.

No. 78. *Liston*.—Aneurismal tumour in axilla seemed to pass upwards under the clavicle, which it had considerably raised. It was afterwards found to extend to the edge of the scalenus, to which it was firmly attached and the muscle incorporated with it. The subclavian lay stretched over it. The subclavian was much enlarged and diseased where the ligature was applied on the outer side of the scalenus: and required a second ligature further towards the heart, and here the subclavian was still more dilated, thick and soft in its coats, and aptly enough compared to the finger of a buckskin glove.

No. 79. *Warren, J. M.*—True subclavian.

No. 80. *Bullen*.—Oval conical aneurism extending from sternal end of third rib to a little above and within a quarter of an inch of humeral end of clavicle.

No. 82. *Savinkoff*.—Tumour under scapular end of left clavicle; thrill felt in third portion of subclavian artery; a trembling movement of coats when passing over first rib. In the course of a month the swelling rose above the clavicle. Much difficulty in tying artery external to the scalenus.

No. 83. *Jobert*.—Tumour under clavicle, and the artery above the clavicle appeared dilated, and in the subclavian fossa it was equal in diameter to that of a man's thumb. At operation subclavian found nine lines in diameter, coats thickened and diseased.

No. 84. *Gregg*.—Tumour commenced under centre of clavicle, and extended towards axilla; difficulty in tying artery close to the scalenus in consequence of the clavicle and the other parts being displaced by the tumour.

No. 85. *Seutin*.—Aneurism of left subclavian; tumour occupying upper part of thorax, below the clavicle, at middle of that bone.

No. 86. *Wiskart*.—The case called by him aneurism of left subclavian and axillary artery; swelling extending along lower margin of clavicle to axilla; it came as a small bean under edge of clavicle.

No. 87. *Porter*.—Also termed aneurism of left subclavian and axillary artery. Tumour seated between clavicle and that part corresponding to the division between pectoralis major and deltoid muscles.

No. 88. *Hobart*.—Called subclavio-axillary. Tumour immediately under right clavicle near its acromial end, and extending towards axilla.

No. 91. *Hayden*.—Tumour situated internal to the axilla, parallel to upper margin of pect. minor, and extending above clavicle. The aneurism was found to pass as far downwards as the scalenus anticus muscle.

TABLE OF CASES OF

No. of case, Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
<i>No Treatment recorded, or</i>				
1. R.	M., 43, delicate	Dilatation of artery 2 years, diffused, enormous	Edema and infiltration of the whole limb	A burst subclavian aneurism, 20 inches in circumference, oblique diameter 10 to 11 inches; clavicle displaced; skin livid, black, sphacelated
2. R.	F., 60	Five months, pullet's egg	Arm useless, swollen, considerable pain, became numb, pulse rapid and weak, turgid veins	Tumour occupied middle of clavicle; sudden and rapid increase; in 2 months half way up the neck, somewhat below clavicle
3. R.	— —	— —	Arm useless, wasting, loss of power, pulse imperceptible	Condition of arm probably due to pressure on cervical nerves, and not to deficient supply of blood
4. L.	M., 38, pedlar, beggar, carrying knapsack with shoulder straps	Eight months, circumscribed, like a chestnut	Pain when travelling with knapsack, skin over tumour natural	Had lost his sight from smallpox at 2 years of age; operated on for stone at 28; severe cough and hæmoptysis for last 8 years; admitted for hæmoptysis; tumour behind and above left clavicle
5. L.	M., 46, labourer in country	Large, diffused	Intense pain	Tumour occupied clavicular, axillary, mammary, and scapular regions; simulating fungoid tumour; subclavio-axillary aneurism, and not aneurism of the origin of left subclavian as stated by Crisp
6. R.	M., 66, gentleman	Three years not detected, large	Intense neuralgic pain down arm, loss of power, no swelling, no atrophy	Had also a popliteal aneurism in right leg; was being treated by pressure of femoral; sudden rupture of sac; amputation refused; gangrene. Subclavian aneurism escaped notice during life
7. R.	M., 50, labourer, strained in lifting	Probably two years, small at first, then enormous	Violent pain from chest to elbow, right pulse stronger than left, swelling and numbness, cyanotic and clubbed finger ends	Had attacks of hæmoptysis; spat up quart of blood. Rapid increase of aneurism from sac bursting; extended within two inches of occiput. Had loss of motion and imperfect sensation in arm
8. R.	M., 45, plasterer, working with arm raised above head	Six months, became diffused	Pain in shoulder, right pulse fuller than left	Tumour extended from anterior part of the trapezius, across subclavian triangle, behind sterno-mastoid, reaching half way up to jaw

SUBCLAVIAN ANEURISM.

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
<i>"Valsalva" Method adopted.</i>			
Not stated, although in hospital some time	— —	Death, exhaustion from effects of aneurism	Boucher, 1760; quote by Robert sur l'Aneurysme, p. 58; Journ. d Méd., vol. xiv, 1761.
Too advanced to operate on	Unable to lie down; sense of suffocation; aneurism gradually subsided	Recovery spontaneous; arm became useful	Hodgson, On the Arteries, p. 137.
Left alone	Aneurism, after rapidly enlarging and beating violently for some months, suddenly lost pulsation; a gradual subsidence spontaneously	Recovery; extreme emaciation of limb and uselessness	Orpen; quoted by Hodgson, p. 351.
Treated for the hæmoptysis	Spat up clear fluid blood; aneurism burst into lungs and bronchi	Death 15 days after admission	Neret, 1837, Archiv. Gén. de Méd., Series 2 vol. ii, p. 203.
Not stated	Aneurism burst externally at base of left scapula; hæmorrhage	Death 12 weeks after admission; profuse sudden hæmorrhage	Dr. Burton, St. Thomas Hosp.; Catal. St. Thomas Museum, vol. iii, p. 75; Prep. 73; Crisp on Aneurism, p. 209.
Large doses of morphia; attention mainly directed to the popliteal aneurism	No rest from pain in the shoulder; emaciation	Death from effect of ruptured popliteal aneurism; exhaustion	Walton, H. H., 1854 Path. Soc. Trans. London vol. v, p. 109.
General medical treatment	Eight months after admission skin gave way, and 1½ pint of arterial blood escaped	Death from hæmorrhage about 24 hours after external rupture	Dr. Ogle, St. George's Hospital; 'Brit. Med. Journ.,' Jan. 1, 1858, p. 62; 'Path. Soc. Trans. vol. x, p. 103.
Could not bear pressure; no operative treatment suggested, as diseased aorta anticipated	Tumour diminished and became harder	Death from dyspnoea, about 1½ years after leaving hospital	Holmes, T., 1861, St. George's; Path. Soc. Trans., vol. xiii, p. 51.

No. of case, Side.	Sex, age, occupation, and supposed cause	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
9. L.	M., 55, works in brass manufactory, no cause	Two and a half years fusion, 4 inches long and $\frac{3}{4}$ inch broad, size of pigeon's egg	Strong arterial pulse without bruit, nutrition of arm not affected, slight numbness	Deficiency of first rib, being not more than $2\frac{1}{4}$ inches in length; the supra-clavicular region tumefied; no symptoms, no pain, or uneasiness
10. R.	M., 55, soldier, spontaneous	Pullet's egg, became diffused	Arm and forearm cedematous	Aneurism extended from clavicle downwards, as far as the eighth rib; 3 large ulcerations of the skin below and before the axilla
11. L.	M.	— —	— —	Aneurismal tumour over left clavicle
12. R.	M., huntsman, inordinate use of arm	— —	— —	Fusiform dilatation of artery in two places, one when passing over first rib, and the other a little lower down; not ascertained during life
12a.	See Appendix			
13. R. L.	M., 60	Twenty-four years, the right cylindrical, small hen's egg, left larger, irregular	— —	Small pulsating tumours were observed on both sides, stretching from scalenus outwards along the clavicles
14. L.	M., 47, forcible struggling	Eight years, pigeon's egg	No pulse at all on left side	Pulsating tumour above clavicle, and skin over it natural
15. R.	M., struck shoulder while walking	Somemonths—a year	Severe pain	Steady increased pulsation; dyspnoea; severe pain at side; subclavian dilated into a large sac
16. R.	M., huntsman, sudden turn of head to one side	Fifteen months, large	— —	Much difficulty in swallowing and respiration; feeling of being always languid
17. R.	F., 28, married, had a bruise at seat	Several weeks, perhaps, free circulation through axillary and rapid increase	Slight pain in arm, free circulation through axillary and carotid artery	Subclavian aneurism combined with aneurism of innominate; painful and throbbing
18. R.	M., 33, lifting weight	One year, small, hard at first, now size of 48 lb. shot	Continual pain and numbness, pulse feeble	Aneurism commenced $1\frac{1}{4}$ inch from external border of clavicle, and extended to where the subclavian becomes axillary
19. R.	M., 64, plumber, carried heavy weights on shoulder	Fourteen months, Spanish nut	Pains in shoulder, rheumatic	Aneurism of subclavian up to scalenus, and aneurism of carotid to bifurcation; innominate involved

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
indication for treatment; nor did the man wish to be operated on	Never increased in size; general health declined; too ill to work; admitted into workhouse	Death from pneumonia, independent of aneurism	Dr. Robert Adams, 1839; Dublin Journ., 1839, vol. xv, p. 494; Poland's paper, Med. Chir. Trans., 1869.
removal of first portion of aneurism; but re-formation of the sac	Suppuration, irritation, fever; no hæmorrhage	Death from exhaustion some months after	Colles, 1813; Edinb. Med. Surg. Journ., vol. ii, p. 13.
operation unfavorable for recovery; operation deferred on, but put off	Pulsation from day to day declined, and tumour diminished spontaneously. There may have been gentle pressure made	Recovery	Porter on Aneurism, p. 76.
operation previous to any rupture; but if aneurism had been attempted passed at usual spot, it would have entered the sac	— —	Death sudden	Porter, op. cit., p. 202; Houston's Catal. Dub., prep. B, c. 285.
operation alone	— —	Death unknown	Vacca Berlinghieri; Dr. Batti's Report in Sprengel's Translation of Scarpa.
operation seemed hopeless	Great difficulty of breathing; slow asphyxia	Death, a few days after admission into hospital, from asphyxia	Guattani, 1777; Script. de Anev., p. 169; quoted by Robert, p. 90.
— —	Sense of suffocation; difficult respiration; lingered for a year	Death sudden	Van Swieten, Comment. Boerhaave Aphor., tom. i, p. 288.
— —	Dyspnoea	Death 15 months after first admission	Hist. de l'Académie des Sciences, 1700, p. 50.
operation failed to undergo the operation, but patient lost sight of	— —	Uncertain	Wardrop, 1827; Lancet, vol. xii, p. 506.
operation refused	Hæmoptysis; perforated into right lung	Death from hæmorrhage in 3 weeks	Guthrie, 1829; Inj. and Dis. of Arteries, 1830, p. 17.
operation and general treatment	Became diffused; reached to chin and threatened to burst externally; attacks of asphyxia	Death sudden	Auchinloss, 1834; Edinb. Med. and Surg. Journ., 1836, vol. xlv, p. 338.

No. of case, Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c
20. L.	— —	— —	— —	Specimen of tumour contained and communicating with the in subclavian; tumour seated on sh symptoms. Query, aneurism or
21. R.	M., 60, epileptic 6 years, rolling heavy packages	Five months, hen's egg, became enormous	Œdematous, wasted, motionless, tingling pain and numbness in fingers, coldness, pulse slight	Aneurism commenced in su region, and extended to axilla a of jaw very rapidly
22. R.	M., 65, repairer of roads, exertion	Many weeks, small orange, became diffused	Acute rheumatic pains in shoulder, hard, swollen, and benumbed, arm weak, anasarca of limb	Aneurism at middle of clavi stated to be subclavian; became and extended downwards 10½ i vertical measurement
23. R.	M., 40, musician, wind instrument, no cause	Only noticed 10 days before death, then size of hen's egg	Pulse silent	The tumour, when observe thought to be a gland; sudden way and became diffused aneurism reaching to chin; irritating co hoarseness for 2 years
24. R.	M., 55, Mulatto, lifting heavy fish	Seven months, hen's egg	Pain and partial loss of power in arm	Small aneurism above clavicle, aneurism of right axillary arter wise large popliteal aneurism on with constant pain in leg and foot
25. R.	M., old soldier	Large	— —	Aneurism filled whole of supra lar region; much constitutional ance; heart's action bad
26. R. L.	M.	— —	— —	Aneurism of left subclavian, al one at origin of right
27. R.	M.	— —	— —	Dilatation of whole of subclav its origin, and extending to the coats thickened and diseased
28. R.	F., middle-aged	Orange	— —	Aneurism formed by dilatation the calibre of the vessel; coats d
29. L.	M., 50	— —	— —	Large aneurism of first portion clavian; no history
30. L.	M., soldier	Size of large chestnut	— —	Small aneurism near origin clavian; pressure on distal side by aortic aneurism; rather large, tending into neck as high as chin
31. R.	F., Princess * * *	— —	— —	Small aneurism seated on first; with friable clot; subclavian artery literated behind the scalenus, the the aneurism

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference
—	—	Specimen questionable	Maisonneuve, Archiv. Gén. de Méd., 1834, tom. iv, p. 448.
treatment, as attentively directed to case before death, when diffused	Pain; want of sleep; became comatose	Death quickly, from exhaustion	Clivier; Bull. de la Soc. Anat., 1848, vol. xliii, p. 211; case quoted by Deville also.
had been bled and, taken digitalis natives, been kept at ice.	Pain and emaciation; aneurism threatened to burst for some time, and eventually gave way	Death from repeated hæmorrhage; from ulcerated surface; lived 9 months	Wardell; Prov. Med. Journ., 1838, p. 378.
large to do any, and patient moribund	Great dyspnoea; paroxysm of asphyxia; threatening to burst externally	Death from exhaustion quickly	Krackowitz; Amer. Med. Times, 1862, vol. iv, April.
ates and stimulants	Occasional hæmorrhage from popliteal tumour; gangrene of leg	Death from exhaustion 2 months after admission	Norris, 1863; Amer. Journ. Med., vol. xvi, p. 401.
n casually; ice and is	—	Unknown	Griesinger, 1866; quoted by Koch, No. 23; Langenbeck's Archiv, 1869, p. 322.
—	—	—	Alison, 1842; quoted by Robert, p. 65; case not to be found.
—	—	Specimen, drawing	Jobert and Bourguery, t. vi, pl. 32.
—	—	Specimen	Catal. Boston Mus., prep. 375, p. 375.
—	Hæmoptysis; aneurism burst into left bronchus and pleura	Death from hæmorrhage	St. Bart. Mus., No. 13, 171.
—	Impediment to deglutition and respiration	Spontaneous cure; death from exhaustion induced by aortic aneurism	Hodgson on Arteries p. 110, pl. viii, fig. 1.
—	—	Spontaneous cure; death from dropy of chest and inflammation of bowels	Ditto, op. cit., p. 113 M. Beauchêne's case.

No. of case, Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
32. L.	— —	Goose egg	— —	No history. Described as subaneurism
33. L.	— —	Small bean	— —	Ditto
34. R.	M., Mulatto	— —	— —	No history or description
35. R.	— —	Size of fist	— —	Ditto
36. R.	— —	Very large	— —	Ditto
37. R.	M., carter, athletic	Hen's egg, became diffused, of enormous size	Great pain, very feeble pulsation in arteries of limb	Tumour occupied entire supra-clav region and part of the neck; by its increase it extended from ribs to jaw
37a. R.	M.	Enormous size	Very feeble pulsation in arteries of limb, great pain	Subclavian aneurism, occupying of right side of neck and anterior superior part of chest; pressure on trachea, impending suffocation. Clavicle destroyed about its middle
38. L.	M., 37, rope-maker, stretching ropes	Three months, pullet's egg	Tingling in fingers and numbness of limb, pulse natural	Tumour above clavicle reaching 4 inches from external end; partly Complained of sleepiness and indolence
39. R.	M., 50, retired officer, army, had syphilis at 24, violent strain	Twelve months, hen's egg	Pain in arm, tingling of fingers, coldness, inability to move limb, no radial or brachial pulse	Subclavian aneurism; treated for rheumatism previously by leeches and vapour bath. Had rheumatism 10 years ago
40. L.	M., 40, coachman, no cause	Three months, size of walnut at first	Intense pain, pulse and temperature of limb normal	Aneurism to left of sternum anterior to the sterno-mastoid, and extending under trapezius. 3½ inches long
41. L.	M., 45, fishmonger, had syphilis	— —	Pain at left clavicle	Tumour of subclavian artery with pulsation; clavicle displaced; great difficulty in breathing

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
—	— —	Specimen	St. Thos. Mus. Cat., vol. iii, p. 79, prep. 74.
—	— —	Specimen	Ditto, prep. 75.
—	— —	Death from rupture of aneurism	Cat. Mus., Fort Pitt, Chatham, p. 60, prep. 54. Presented by Dr. Portelli, of Malta.
—	Rupture of sac	Death from hæmorrhage	Cat. Mus., Calcutta, p. 183, prep. 694. Presented by Dr. O'Shaughnessy.
—	— —	Specimen	Cat. Hunterian Mus., Roy. Coll. Surg. Eng., prep. 1691.
strict diet, cold compresses soaked in lotion, venesection, moderate degree; Valsalva treatment	Pressure on trachea, and threatening suffocation. Clavicle destroyed about its middle	Diminished to a small tumour, with feeble pulsation. Seen 2 years after in same state in process of cure	Guérin, 1790; Erichsen, Obs. Aneur., p. 472.
strict diet; refrigerant astringents locally Valsalva treatment moderate degree	Gradual diminution to small size, occupying lower part of neck, with feeble pulsation	In process of cure, able to go about, and loss of all sense of suffocation	Guérin fils, 1812; Roux, Pratique Chir., t. ii, p. 68.
digitalis and occasional purgatives for 4 days then only moderate employed and persevered over a period of 3 months assisted by direct pressure on the tumour	Patient became much reduced and weakened. Gradual subsidence of tumour	Entire recovery	Yeatman, 1813; Med. and Phys. Journ., vol. xxxiii, p. 377.
attack of severe inflammation of bowels, for 3 days underwent very acrimonious and spare diet previously underwent any operation aneurism	Gradual, spontaneous diminution of the aneurism. Wasting of the limb, and inability to move it	Recovery, with subsequent return of pulsation and circulation in the limb	Cloquet and Bernardin, Archiv. Gén. de Méd., 1824, t. vi, p. 511.
and ice; morphia, cannabis indica form, &c.	Subsequently extended into axilla and along the thoracic region. Sudden further increase from rupture	Death from exhaustion 6 months after admission	Oppolzer, 1863; Allg. Wien. Med. Zeits., 1863, pp. 187, 194.
treatment. Sarzaparilla	Tumour and pulsation disappeared. Artery remained patent, and was larger than natural	Recovery. No return after 5 years	Lancisi, 1728; Lauth's Coll., p. 53; Erichsen, Obs. Aneur., p. 37.

No. of case, Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
42. L.	M., player on harp, had syphilis	— —	— —	Aneurism under clavicle is call clavian
43. R.	M., 39, lifting weight	Six months, became diffused, five inches long	Intense pain down arm, pulse extremely feeble	Tumour reached from above clavicle the third rib, extending from sternoid to shoulder, and pushing up
44. R.	F., 69, supposed reduction of a dislocation	Two months, diffused above and below clavicle	Excessive pain and weakness of arm, infiltration	Large axillary aneurism involved inches of subclavian; no pulsation. Query, chronic abscess. Exploratory incision; hæmorrhage; compress and bandage
45. R.	M., 43, labourer, rheumatism	Eight months, small apple	Pain, numbness and tingling in arm and fingers, pulse almost imperceptible	Aneurism involved whole length of clavian and two-thirds of innominate. Dyspnœa and dysphagia
46. R. Subclavio-axillary.	M., 37, engine maker, formerly sailor, severe blow	Six months, very large and diffused	Dull, aching pain, with numbness, œdema, pulse questionably to be felt	Large subclavio-axillary aneurism at the root of the neck. Subclavian artery in its axillary portion proved to have been displaced about 1 inch beyond the origin of its branches
47. R.	M., 42	Axillary and subclavian, size of child's head, axilla	— —	Aneurism projected from beneath clavicle, and judged to be subclavian
<i>Moxa and Hypoc</i>				
48. R.	M., 45, strong, healthy, supposed rheumatism	Eight months, size of pigeon's egg, then that of fist	Pain in arm and weakness of limb; pulse stronger than opposite side, and somewhat later in its beat; peculiar condition of fingers' ends	Tumour occupied supra-clavicular region, extending to supra-sternal fossa, and that whole subclavian and innominate were involved; very strong pulsation; great pain in it; complained of stiffness
49. R.	M., 46, shipwright, no assignable cause	Two years, lately size of hen's egg, flattened, fluid contents	Arm weak and painful, pain behind shoulder; pulse feeble; limb cold	Appeared to be a general dilatation of the subclavian artery, and occupied supraclavicular region; patient had been the subject of popliteal aneurism on both sides, cured by pressure on the femoral artery

atment.	Secondary effects, &c.	Result and cause of death.	Reference.
eatment. Sarza philitics	Tumour and pulsation in it disappeared. Artery remained patent, and was larger than natural	Recovery. No return after 6 years	Lancisi, 1728; Lauth's Coll., p. 53; Erichsen, Obs. Aneur., p. 37.
pely, squilla, di- ite. Operation about to be per- dden syncope. by mistake 30 ongest tincture	Gradual diminution of tumour. Enlisted as soldier. Lived 8 years, and died of internal aneurism	Recovery. No ex-amination when he died 8 years after	Pencoast, 1857; Pennsylvania Hosp. Rep., 1861, vol. i, p. 215.
of artery pro- jected to. reatment and 1	Eschars formed; hæmorrhage took place. Sloughing of sac	Death. Rapid ex-haustion from hæ-morrhage	Dupuytren, 1810; Lancet, Sept. 21, 1833, p. 805.
tinually; good no stimulants. painted over at a month	Tumour became harder, but increased in size. Hæ-moptysis; ulceration of aneurism into trachea	Death from ex-haustion. Distal por-tion of sac in pro-cess of cure	Dr. Davis; Lond. Hos. Rep., 1864, vol. i, p. 1, plate.
et, purgatives. alis, continued stha. Operation and dissented	Rapid increase; exten-sion into neck and chest. Pressure on trachea. Bed sores	Death from ex-haustion. Coma	Lawrence, 1827; Lan-cet, 1827-28, vol. i, p. 857.
strict quietude; Ligature of sub- posed, but pa- lered to be too	Considerable diminution and great improvement in health, but was only under observation a month	In process of cure	Lloyd, St. Bartholo-mew's; Lancet, 1835-36, vol. i, p. 33.
of Ergot.			
's moxa of romata applied ar, inducing a ; surface; 4 d at intervals of ch for 3 months	Symptoms relieved, he could attend to business, and tumour diminished; remained well for three years, and disease reap-peared worse than before; hypodermic injection of solution of ergot for 3 weeks with great relief, and subsidence of tumour	Recovery, or rather process of cure commencing, as pe-riod too short	Langenbeck, 1869; Berliner Wochenschrift, March, 1869, No. 12.
sion.			
rest; diet with- direct general 1 by wearing a p moulded to oderate diet	Gradual hardening, with diminution and loss of pul-sation	Cured; no trace or vestige of aneu-rism or artery; fol-lows his usual em-ployment	Corner: Poplar Hos-pital; Med.-Chir. Trans. for 1869.

No. of case, Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
50. L.	M., 39, ship's cook, strain	Fourteen months, circumference about $7\frac{1}{2}$ inches	Excessive pain in arm, enormously swollen	Tumour occupied whole triangle above the clavicle
51. R.	M., 41, steam machinery for 27 yrs., change of temp.	Thirteen months, paid no attention to it until of large size, formerly that of pigeon's egg	Pulse full; pain in tumour	Irregular large aneurism seated in the middle of the clavicle, and in the clavicular space; presented 3 projections; had in it a sensation of weight; throbbing; shortness of breath
52. R.	M., 44, labourer, no cause	Unaware of its existence till now, size of filbert	No pulsation in radial, ulnar, or brachial vessel; great pain in arm, weak, and always cold and numb; club-shaped finger-ends	<i>Compression of Artery</i> Fusiform, an inch or more long, half an inch wide; fluid content very strong; abnormal convexity over the 6th rib
53. R.	M., 36, German farmer, muscular exertion	Three weeks, hen's egg	Pain throughout limb	<i>Injury</i> Rapid increase of size; became pulsatile; artery probably torn across
54.	— —	— —	— —	Subclavian aneurism
* L.	M., 25, cultivator, stabbed with knife	One month, size of two fists	Severe pain in whole limb, œdema, loss of sensation and motion; no pulsation in radial, ulnar, brachial, or axillary	<i>Application of Eschscholtz's Ligature</i> Wound of left subclavian artery; direct compression; consequent recurrent hæmorrhages; night or day from extreme agony; termination of traumatic aneurism
55. R.	M., 43, labourer, spontaneous	Fourteen months, duck's egg	Slight pain in limb, numbness, pulse weaker than opposite	Subclavian aneurism, $3\frac{1}{2}$ inches long, $\frac{1}{2}$ inch thick; has also small femoral aneurism below Poupart's ligament on right

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
room for proximal, and distal ligature red not worth at- g; heavy weight directly over aneu- without immediate	Left hospital, when he received an injury causing the tumour to inflame, sup- purate, and burst exter- nally, and about 2 quarts of blood escaped; middle of clavicle eroded, and a portion lost; arm in sling	. Recovery at the end of 2 years, and able to attend to ordinary duty	Warren, J. M., 1854; Surg. Observ., p. 425.
ted diet; bags of direct compression ely; sensible re- of pulsation; pres- t off on tenth day	Was much benefited, but he left the hospital; the tumour, however, gradu- ally subsided	Recovery, and about one year after was quite cured	Warren, J. M., 1857; op. cit., p. 427.
<i>ic side of the Aneurism.</i>			
al compression of for 96 hours	Tumour became more solid, but pulsated; after leaving hospital gradual entire consolidation, and subsidence of pulsation	Cured at end of 2 months after leav- ing; both tumour and pulsation dis- appeared; merely fibrous cord left	Poland, 1868; Med.-Chir. Trans., 1869.
<i>Sac.</i>			
tion of perchloride through 3 punc- inflammation and on of punctures; hage	Tumour 11 days after, the size of ostrich egg; punctures sloughed; great hæmorrhage; enormous extension, and threatening gangrene of limb; pressure on trachea; large open slough	Death from ex- haustion, and gra- dual draining from hæmorrhage	Quoted by Forbes, 1859; North Amer. Med.-Chir. Rev., 1859, vol. iii, p. 304; Gaz. Médicale, 1861, p. 241.
tion into sac, fol- ly immediate death	— —	Death, imme- diate; no p. m.	Mott.
<i>Tumour.</i>			
l Faradization, no application of chlo- zinc paste at the 3 weeks; many re-	The repeated applica- tions caused repetition of sloughs and hæmorrhage; checked by compression; continued until sac sloughed open; had six severe hæ- morrhages; granulation and cicatrization	Cured at end of 4 months; regained sensation in limb; pulsation in vessels did not return	Bonnet, 1852; Bull. de la Soc. d'Anatomie, t. iii, p. 608, 1852; Med. Times and Gazette, July, 1853.
<i>re.</i>			
ure had been insuf- acupressure of ax- artery; successful n; acupressure of ata 1 month after; for 60 hours	Sloughing of artery, of anterior walls, where pres- sure made; severe and re- peated hæmorrhages	Death from hæ- morrhage 10 days after acupressure of innominate	Porter, 1867; Dub. Quart. Journ. of Med., Nov. 1867, No. 5, vol. xlv, p. 269, plate.

No. of case. Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
<i>Manip</i>				
56. R.	M., 40, spontaneous	Two years, small orange	Pulse as distinct as usual	Tumour at bottom of right side of neck, chiefly between the scaleni; a much fibrin in it; patient had paid attention to the swelling for the 2 years
57. R.	M., 44, sailor, spontaneous	Nine months, small orange	Numbness and gnawing pains down limb, with tingling in fingers; no pulse at wrist for 5 months	Very similar to above in detail
58. R.	M., 53, Albino, carrying weight by a rope round neck	Eight months, goose's egg	Severe constant pain down arm	Subclavian aneurism, with the skin over it red, inflamed, and threatening rupture
59. L.	M., 36, labourer, severe jerk	Half an orange	Swelling of arm	— —
<i>Galvano</i>				
60. L.	F., 65, spinster	Hen's egg, long since	Some pain	Situated above clavicle, and remained stationary until 3 months back, when sensibly increasing; it extended then under the clavicle
<i>Attempt a</i>				
61. L. Subclavio-axillary	M., 40	Six months, very large, although small at first	— —	Tumour occupied whole of left shoulder and the greater part of the clavicle extending under the pectoral muscles and considered to be subclavian; also had aneurism of femoral artery
62. R.	M., 47, labourer, spontaneous	Two and a half years, slow increase, from small kernel to present size	Numbness and pain, hand blue and colder than other; no pulse at wrist or bend of arm	Large pulsating tumour on right side of neck, hard and firm, 5½ inches by inches
63. R.	F., 46, wife of green grocer, lifting heavy weights	Three months, pigeon's egg	Rheumatic pains in shoulder and arm; both radials equal	Supposed aneurism, confined to the subclavian artery; no bruit; heart sound natural

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
manipulation employed, followed by digital compression on proximate side of face, arm, and radial, brachial, axillary	On following day all pulsation renewed; a second manipulation on 2nd day, with same results; aneurism ran ordinary course; great pain and emaciation	Died 8 months after, from bursting of sac and exhaustion from pain, &c.	Fergusson, 1852; Med. Chir. Trans., vol. xl, p. 7.
manipulation, followed an hour by paralysis of face, arm, and radial, brachial, axillary	Tumour resumed its previous condition; manipulation repeated in 2 weeks' time, but no effect	Continued in same state for 1 year, when, at expiration of 2 years, tumour wholly disappeared	Ditto, 1855; Ditto, op. cit., p. 13.
lynes, cold, ice, V.S.	Tumour more solid at end of a month; slowly diminished; limb partially paralysed in both motion and sensation; at end of 1 year one third less, and no pulsation; quite solid	Cured; in 15 months paralysis passed off, and tumour size of walnut	Little, 1857; Med. Times and Gaz., May 25, 1857, p. 508.
digital compression on proximate side of face, arm, and radial, brachial, axillary	Became diffused, and increased to enormous size	Death from exhaustion 9 months after admission	Hilton & Forster, 1861; Lancet, June, 1861, p. 561; Prep. Guy's Mus., No. 1501 ⁹⁷ .
needles traversed tumour; current induction for 5 minutes; eschars detached; became hard and without suppuration; in 3 months tumour half the size	Next day whole limb cold, engorged, and sloughing; in 4 days pulse returned; eschars detached; became hard and without suppuration; in 3 months tumour half the size	Cured; seen 2 years after, no return of disease; pulse smaller than opposite	Abeille, 1847; Archiv. Gén. de Méd., Ser. iv, t. xx, p. 491.
operation to tie subclavian in third portion; 50 minutes unsuccessful; much done to soft	Constitutional disturbance; delirium, requiring V.S., purgatives, &c.	Death from exhaustion on the 6th day	Sir A. Cooper, 1809; Mott's Edition of Velpeau, vol. ii, p. 303.
operation to tie art. innominate; 1½ hour; to be found	Aneurism gradually diminished; feeling and motion of limb returned; aneurism had entirely disappeared when seen 7 years after	Recovery, and resumed his former occupation	Porter, 1832; Lecture delivered in 1839-40; Dub. Journ., vol. i, p. 25.
operation to tie innominate; ¾ of an hour; to limit to the sac and	Hæmorrhage from wound on 7th day; increase of aneurism; dyspnoea; difficult respiration; pressure on trachea	Death on the 23rd day	Key, 1844; Crisp on Arteries, p. 206.

No. of case. Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
64. R.	M., 63, Negro, spontaneous	Five months, circular basis of 5 inches	— —	Tumour chiefly extended below clavicle; found to involve whole clavian artery
65. R.	— —	— —	Pain in arm; pulse almost imperceptible	Pulsating tumour in axilla; sub found involved, and sac had given most intense suffering
66. R.	— — private case, rheumatism	Size of half an orange	Most severe pain in the limb	Tumour found to occupy greater the axilla, and pouch extending clavicle; first and second ribs afterwards to have been involved, aneurism extending into chest
67.	M., 42	— —	— —	Subclavian aneurism
Same case as No. 64. R.	M., 63	— —	— —	Subclavian aneurism
<i>Ligature of the third portion of the Subcl</i>				
68. R.*	M., 48, clergyman, fell from horse and rolled over	Goose egg. 6 months, fusiform	Rheumatic pains, pulse not felt	Considered at first to be rheum and electrified; absence of pulse detection of aneurism
69. R.*	M., 73, countryman, spontaneous	Swan's egg, 3 months	Pain in tumour	Subclavio-axillary, extending up ing a pouch-like enlargement above vicle, and below pushing the p muscle forwards
70. R.*	M., 50, stableman, spontaneous	Two months, small lemon, fusiform dilatation of subclavian	Coldness and numbness, pulse at both wrists equal	Whole arterial system under considerable excitement; brachial artery ingly tortuous

* Subclavio-axillary.

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
Attempt to tie the innominate; could not ligate, on the extensive dissection of the vessel, and its aneurismatic condition	— —	Death from exhaustion in 3 months	Hoffmann, 1840; Gross, Surgery; New York Hosp. Mus., prep. No. 630, Cat., p. 258.
Attempt to tie outer subclavian the sac penetrated, followed by hæmorrhage, by pressure	Repeated hæmorrhages	Death from hæmorrhage in 10 days	Cusack, 1840; Dub. Journ., vol. xvi, p. 332.
Attempt to tie subclavian, in consequence of being involved	— —	Death	Lawrence; Lancet, 1827, vol. i, p. 857.
Ligation attempted, for a long time, and failed; stated to have lasted hours	— —	Death	Lancet, 1833-34, vol. ii, p. 57; St. Thomas's Hosp.
Operative operation to divide the subclavian first, or the innominate; vessels too diseased to be exposed, and therefore not ligatured	— —	Death from exhaustion 12 weeks after operation	Post, 1840; New York Journ. of Med., No. 4, p. 370; ? Same case as Hoffman, No. 64, in all probability.
<i>Subclavian and Subclavio-Axillary Aneurism.</i>			
Wound made and bled a good deal; he was reduced; the third portion of the scalenus and the innominate sac; jugular vein tied	V.S. and digitalis; rigors; and great constitutional irritation followed; delirium; rapid gangrene of limb	Death from prostration on the 5th day	Colles, 1815; Edinb. Med. and Surg. Journ., vol. ii, p. 15.
Attempt to divide subclavian, passing needle sac secured; hæmorrhage; secured, but did not succeed after cessation of blood	Oppressed respiration and full pulse; V.S.; spasm of diaphragm; stertorous breathing	Death from prostration on 4th day; gradually sank	Travers, 1823; Lond. Med. Journ., New Series, vol. ii, p. 333.
Attempt applied close to the sac; artery at first found dilated to its natural size, and its surrounding consolidated lymph	Suppuration about wound; high febrile symptoms; Query, pyæmia	Death from exhaustion on 7th day	Brodie, 1831; Lond. Med. Gaz., vol. ix, p. 454.

No. of case. Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
71. L.*	M., 65, weaver, no injury	Eighteen months, pyriform dilatation of artery	Pain and numbness, limb swollen and oedematous, pulse very feeble, temperature natural	Aneurism, 6 inches by 2½; a portion of the tumour tapered above clavicle, less in thickness than top of thumb, extending to scaleni; had cough and slight dyspnoea
72. L.*	M., clergyman, spontaneous	Two months, half hen's egg, and extended above clavicle	Numbness and coldness, no pulse in radial, and feeble in brachial	Rapid increase; pressure on median nerve; artery could not be traced for ½ an inch up from tumour to scalenus anticus muscle
73. L.*	M., 50, workman on barges, heavy rowing	Six weeks, turkey's egg	Intense pain in axilla, numbness of whole limb, pulse full and labouring	Aneurism in axilla, and rose up considerably in the neck; clavicle displaced scarcely any artery between sac and scalenus; and question as to propriety of ligating the third portion in usual place or distal operation
74. R.*	M., 59, hay-binder, rheumatism	Two years, orange	Great pain, partial paralysis of arm, pulse more feeble than on other side	Subclavio-axillary; dilatation of the subclavian to within ¼ of an inch of scalenus anticus; had much arched clavicle
75. R.*	M., 54, soldier, rheumatism	Four months, orange	Numbness	Aneurism above and below clavicle forming 2 sacs; that in the axilla of size of two fists; subclavian aneurism a dilatation of artery
76. L.	F., 21, muscular exertion during fall	Size of hen's egg	— —	Aneurism occupied the neck close to the scalenus, in the posterior triangle above clavicle
77. R.	M., 35, workman, heavy hammering	Small size	— —	Subclavian aneurism
78. R.*	M., 43, fall, supposed rheumatism	Tumour observed nine months, for 10 weeks had sensation, temperature reached size of foot-ball	Enormously swollen, pulse imperceptible, loss of motion and sensation, temperature natural	Subclavio-axillary; the aneurism extended up to near scalenus under clavicle, subclavian involved

* Subclavio-axillary.

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
<p>close to scaleni, $\frac{1}{4}$ of the fibres divided to avoid This case placed under ligature of between the scaleni</p>	<p>Comatose symptoms came on; apoplectic</p>	<p>Death on the 3rd day from serous effusion on brain</p>	<p>Auchinloss, 1833; Edinb. Med. and Surg. Journ., vol. xlv, p. 324.</p>
<p>close to scalenus</p>	<p>Difficulty of swallowing and dyspnoea; cough; severe attack of rheumatism, and chronic phlebitis of left leg; ligature came away on 47th day</p>	<p>Recovery. Seen at end of 9 years, quite well</p>	<p>Skey, 1841; Operative Surgery, p. 222.</p>
<p>external to sca-</p>	<p>Had pleurisy and pneumonia and empyema; no hæmorrhage</p>	<p>Death on 15th day. No inspection</p>	<p>Cooper, B. B., 1841; Guy's Hosp. Report, Ser. I, vol. vi, p. 348.</p>
<p>close to sca- bliged to divide portion of sternocleidomastoid consequence of ism</p>	<p>Went on well until 9th day, when hæmorrhage</p>	<p>Death from hæmorrhage on 12th day</p>	<p>Blaker, 1855; Med. Times and Gaz., 1856, Jan. 19, p. 63.</p>
<p>ession ineffectual; close to the sca-</p>	<p>Went on well till 13th day; slight hæmorrhage; pyæmic symptoms on 23rd day; ligature came away on 20th day; hæmorrhage recurred on 41st, 52nd, and 65th days</p>	<p>Death from hæmorrhage on 65th day</p>	<p>Paget, 1860; Med. Times and Gaz., Sept., 1860.</p>
<p>om to try compres- ature of third por- l necessity of di- bres of the sca- Placed by some ligature of artery the scaleni</p>	<p>Never had a bad symptom or any inconvenience; ligature came away on the 20th day</p>	<p>Recovery</p>	<p>Nicholls, 1832; Lond. Med. Gaz., vol. ii, p. 242; Lancet, 1832.</p>
<p>ure of artery close calenus; nerve in- ligature; frightful ligature loosened e excluded</p>	<p>Never had a bad symptom</p>	<p>Recovery. Seen many years after quite well</p>	<p>Green, 1844; quoted by Crisp; seen and confirmed by Mr. Solly.</p>
<p>eof external third; age; artery much sac punctured; ligature between of inch further to side; artery still and diseased</p>	<p>Was doing well; when on 13th day hæmorrhage from seat of ligature</p>	<p>Death from hæmorrhage on the 14th day</p>	<p>Liston, 1826; Edinb. Med. and Surg. Journ., 1827, vol. xxvii, p. 4.</p>

No. of case. Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c
79. L.	F., 30, drawing cork of bottle	Four months, pigeon's egg, rapid increase	Pain and numbness	Tumour above scapular end of towards scapulus; peculiarity of artery, had distorted spine where great length of third portion of a
80. R.*	M., 60, sailor, barrel fell on shoulder	Four months, oval or conical	Swollen, pain and numbness, pulse of radial and brachial scarcely felt	Aneurism extended from sternum third rib to a little above, and fourth of the humeral extremity; clavicle; it projected a little at acromial end
81.	— —	— —	— —	Subclavian aneurism
82. L.*	M., 30, cooper, carrying weights with rope across neck, syphilis	Four and a half months, hen's egg	Weakness of arm, numbness in fingers, acute pain, pulse weaker than other	Aneurism situated under acromion of clavicle, lying to inner side of humerus and extended above clavicle; condition of subclavian artery; above clavicle reached to the goose's egg; veins enlarged; skin
83. R.*	M., 61, sawyer of wood, carrying weights on yokes	Six months, goose's egg, fusiform	Numbness and tingling of fingers, sensation good, deficient muscular power, pulse more feeble, temperature equal	Subclavio-axillary; the subclavian artery dilated to size of thumb; double bruit along course of subclavian artery; no dyspnoea; pulse of right stronger than left
84. R.*	M., 40, soldier, latterly a porter, rheumatism	Three months, large	Intense pain in arm and shoulder; numbness	Aneurism extended from under two-thirds of clavicle, which lay elevated about an inch, down in occupying anterior half: report subclavian aneurism; great want
85. L.*	M., 44, syphilis	Half a hen's egg	Acute pain down arm, pulse weaker and more easily compressible than other	Aneurism at upper part of thorax to clavicle, slowly developed, considered to be subclavian; dyspnoea; cephalalgia; nothing abnormal in chest; rapid increase in size
86. L.*	M., 47, porter, rheumatism	Six weeks, large, described as subclavian	Pain in elbow, great weakness of limb, oedema, pulse feeble, and ceased after admission as far as the humeral artery	Aneurism occupied axilla, and lay up under the clavicle, and formed considerable swelling under the pectoral muscles; pulsation became indistinct
87. L.*	M., 40, ostler, spontaneous	Half hen's egg, never aware of its existence at any time	Pain down arm, distressing sense of numbness, oedema, at contraction of fingers	Aneurism below clavicle in space between pectoral muscle and deltoid; placement of clavicle; rapid increase; scribed as subclavian; great want

* Subclavio-axillary.

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
Ligature close to scaleni. Placed incorrectly by some under ligature between the scaleni	Rapidity of collateral circulation; ligature came away on 96th day	Recovery. About 1 year after had fever and died. No p. m.	Warren, J. M., 184 Surgical Observation American Journ. of Me N. S., vol. xvii, p. 13.
Ligature of third portion, but division of the scalenus requisite; no account of difficulty in ligating. Placed under ligature between scaleni	Went on well till 16th day, when hæmorrhage on pressure; ligature came away on 21st day; hæmoptysis on 26th day	Recovery; aneurism communicated with the lung	Bullen, 1823; Lor Med. Repository, vol. 1 Sept., 1823.
Ligature of artery in outer third	Became diffused	Death	Gore, Bath Hosp Lancet, 1851, vol. ii, 173.
Could not bear compression; Valsalva treatment ineffectual; ligature close to scaleni, and great difficulty in operation	Ligature came away on 13th day	Recovery	Sawinkoff, 182 Graefe and Walthe Journ., 1824, bd. vi, 662.
Valsalva treatment for 18 days with benefit; ligature external to scalenus; artery very large and adherent; difficulty in operation	Aneurism discovered on 5th day near to the sternum; abscess formed over shoulder; hæmorrhage on 28th day	Death from hæmorrhage and exhaustion on 29th day	Jobert, 1837; L'E expérience, 1838, vol. i, 483.
Ligature close to the scaleni; difficulty in operation from position of the tumour and clavicle	Pneumonia; pyæmic symptoms; abscess; delirium; hæmorrhage on 8th day, after throwing arm about, from ligatured vessel	Death from hæmorrhage on 8th day	Gregg, 1857; D Quart. Journ., vol. x p. 211.
Abstinence; V. S.; digitalis; compression on artery failed; ligature close to scalenus	Ligature came away on 20th day; got up and walked about on 26th day, when hæmorrhage; recurrent attacks	Death from hæmorrhage on 35th day	Seutin, 1834; B Méd. Belge, Sept., 18
Ligature close to external border of scalenus	Went on well till 10th day, when febrile symptoms; V. S. and digitalis; ligature came away on 16th day	Recovery; had an axillary abscess	Wishart, 1823; Edin Med. and Surg. Jour 1824, vol. xxi, p. 16.
Rest; cold; purgatives; V. S.; ligature of subclavian close to scalenus	Ligature came away on 17th day; inflammation and suppuration on 25th day; large abscess opened on 45th day	Recovery; able to follow occupation; 5 months after fell on shoulder; had only temporary paralysis	Porter, 1829; D Hosp. Rep., vol. v, 198.

No. of case.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
88. R.*	M., 38, merchant, spontaneous	Four months, somewhat larger than hen's egg	Occasional inconvenience in moving arm; and obliged to use left; acute pain in scapula	Aneurism immediately under armpit, end of clavicle, extending towards shoulder; rapid increase
<i>Ligature of the</i>				
89. R.	M., 33, labourer, muscular exertion	Three to five months, conical	Pain and numbness down arm; pulse of both wrists equal; slight numbness in fingers	Aneurism extended from sternum to axilla; uneasiness about axilla; relieved by V.S.
90. R.	F., 21, married, thrown from gig on shoulder	Two years, hen's egg	Deep seated, fixed pain in shoulder; pulse at wrist felt	Subclavian aneurism; rapidly increasing; health suffering
91. R.	F., 57, spinster, domestic, spontaneous	Ten months, large	Pain in shoulder, and numbness down arm; oedema of limb	Aneurism extended from scales to axilla; no contra-indication to operation; after stethoscopic examination; preparatory treatment by V.S. and laxative
92. R.	M., 39, stable helper, spontaneous	Three months, 2½ by 2 inches	Numbness and uneasiness in fingers and arms; occasional cramps	Aneurism extending from scales to axilla; obliged to keep in bed for 8 weeks with the arm extended so as to relieve the severe pain; heart and lungs considered healthy
93. R.	M., 38, polisher of iron plates, great muscular exertion	Five months, large	Pulse at both wrists full, soft, and regular; pain and numbness; limb wasted	Subclavian aneurism; has been subject of rheumatism; preparatory treatment by V.S. 4 times at intervals of 4 days
94. R.	M., 32, clerk at wharf, left handed, spontaneous	Seven weeks, hen's egg	Numbness and weakness of the muscles: pulse somewhat smaller	Subclavian aneurism; rapid increase
95. L.	M., 42, labourer, carries heavy weights on left shoulder	Four weeks, small hen's egg	Severe pain down arm; limb swollen; no difference in the pulse	Subclavian aneurism; health suffering; great want of rest; intense suffering
96. R.	M., 50, glazier, attempts at reducing dislocation of shoulder	Nine months, large walnut	Pain in limb; slight oedema; pulse weaker than opposite	Subclavian aneurism; reduction of aneurism was followed by intense pain and swelling; the tumour is external, above the clavicle; has caused anxiety, and sleeplessness

* Subclavio-axillary.

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
atives; V.S. largely; ligature close to of scalenus	No bad symptoms; ligature came away on 23rd day	Recovery; tumour entirely disappeared; recovered use of arm	Hobart, 1836; Edinb. Med. and Surg. Journ., vol. xlv, p. 48.
<i>n of the Subclavian.</i>			
ry tied near to innominate as unhealthy, and not tightened much V.S.; low diet; very 5th day; at time of slight hæmorrhage; common pleura wounded; hoarseness of breath; sense of suffocation; delirium	Great oppression of breathing and dyspnoea; V.S.; low diet; very 5th day; at time of slight hæmorrhage; common pleura wounded; hoarseness of breath; sense of suffocation; delirium	Death on 9th day	Colles, 1818; Edinb. Med. and Surg. Journ., vol. ii, p. 1.
ture of first portion	Hæmorrhage on 9th day; recurrent attacks; severe one on 18th day	Death from hæmorrhage on 19th day; no p. m.	Mott, 1851; Amer. Journ. Med. Sc., 1833, vol. xii, p. 354.
ture of first portion, after completion tumour diminished, but soon began again in the course of exertion, and without	Bronchitis; went on favorably until 10th day, when hæmorrhage after day	Death from hæmorrhage on 12th day	Hayden, 1835; Lancet, 1837-38, vol. i, p. 47; Houston's Catal., prep. B., c. 283.
ture of first portion	Was doing well, when had an attack of bronchitis and pneumonia; subsequently repeated hæmorrhages	Death from hæmorrhage on the 23rd day	O'Reilly, 1836; Flood on the Arteries, by Fowler, p. 69; Dr. R. Adams' Report referred to.
ture of first portion	Pericarditis and pleurisy supervened; pus about wound	Death on 4th day; Pyæmia	Partridge, 1841; Lancet, 1840-41, vol. ii, p. 603.
ture of first portion; difficulty on account of usual position of artery	Doing well up to 23rd day, when hæmorrhage repeated 3 times, the last fatal	Death from hæmorrhage on 36th day	Liston, 1839; Lancet, 1839-40, vol. i, p. 37.
laxatives, digitalis; e of first portion at f vertebral, and between the scaleni	Erysipelas on 3rd day, and subsided; hæmorrhage on the 13th day	Death from hæmorrhage on 15th day	Rodgers, 1845; New York Journ. of Med., March, 1846.
ture of first portion; atiphlogistics; digitalis	On 7th day febrile and cerebral symptoms; hæmorrhage on the 9th day; suppuration of wound	Death from hæmorrhage on 11th day	Auvert; Selecta Praxis Med.-Chir., Tab. lv, lvi, Paris, 1848.

No. of case.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
97. R.	M., sub-officer, spontaneous	Large, three inches above and two inches below clavicle	Right hand swollen; œdema; severe pain	Aneurism occupied region of extending from sterno-mastoid to axilla; clavicle partly absorbed at ends thrown forwards; no rest day from pain; very weak; liver and painful; dyspnœa; cough
98. R.	M. 21, external injury	Said to be 10 weeks, large, diffused	Hand and arm swollen and œdematous	Aneurism extended from clavicle to nipple; and from thence to axilla; scapula; clavicle pushed upward and undergone the valsalva treatment
99. R. * Axillary	M., 36, porter, carrying weight on shoulder, rheumatism	Large orange	Intense pain; œdema interfered with motion	Subclavio-axillary; clavicle pushed up; it was at first supposed to be an aneurism and the patient refused to have it removed. Suffered from general rheumatism years.
<i>Ligature</i>				
99. R.	M., 57, sailor, muscular exertion, fall on shoulder	Three months, small, became very large and diffused	Pain in shoulder; unable to raise arm; no difference in pulse at wrists	Was small, hard, and circumscribed; first, then gave way, occupying large extent of surface, subclavian aneurism at acromion
100. R.	M.	— —	Frightful pain	Subclavian aneurism of rapid growth; great anxiety
101. R.	M.	— —	— —	Subclavian aneurism
102. R.	M., 36, countryman, blow on shoulder	One year, goose egg	Pain in arm so severe as to prevent sleep, and loss of use	Subclavian aneurism behind clavicle; commenced as a tumour, which subsided under cold applications; reappeared six weeks ago, and has since increased in size
103. R.	M., 52, labourer, no cause	About eight months, half a large orange	Almost complete paralysis of arm; œdema; pulse at both wrists full and frequent	Subclavian aneurism, very large; respiration and deglutition at times difficult; has syphilitic ulceration of neck and shoulder
104. R.	M., 31	Two years, pigeon's egg, spontaneous	Pain and numbness down arm; sensation normal; perfect use of limb	Subclavian aneurism; slow and gradual increase; had undergone Valsalva's treatment during first six months; could not lie down at night and day; now cannot lie down on left side from pain

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
ture of artery one om origin; artery	Pulsation ceased and tumour collapsed; V.S. one hour after operation; arm diminished in size, and became colder; febrile symptoms; slight jaundice; query pyæmia	Death from exhaustion on 5th day; no hæmorrhage	Arendt, 1826; Dietrich, p. 184; Verm. Abh. von prakt. Aerzte zu St. Petersburg.
ture of artery close inner side of scale- formed with great y	Some 24 hours after operation, while trying to raise himself in bed with both arms, died suddenly from bursting of sac	Death from hæmorrhage in 24 hours	Bayer, 1829; Dietrich Collect., p. 31.
ture of first portion clavian; V.S. after on	Went on well for 8 days, then had pneumonia; wound suppurated; arterial hæmorrhage on 13th day; several repetitions	Death from hæmorrhage and pneumonia on 22nd day	Auvert, op. cit., Tab. lvii and lviii.
<i>innominata.</i>			
ture of innominata inch below bifurca-	Ligature came away on 14th day; hæmorrhage on the 23rd day; suppuration and ulceration of the wound	Death from hæmorrhage on the 26th day	Mott; New York Med. Repository, 1818, vol. i.
ture applied 1 inch rch of aorta	Relief to all symptoms; ligature came away on the 14th day; hæmorrhage not until 60th day, then recurrent	Death from hæmorrhage on the 67th day	Graefe, 1822; Graefe und Walther's Journ., Bd. iv.
ture of innominata	Pericarditis ?	Death from hæmorrhage in 60 hours	Norman, 1824; Bath Hospital.
talial, V.S., rest, ice; of innominata half below bifurcation	Inflammation of sac, pleura, and lungs; suppurating wound, &c., and symptoms of pyæmia	Death from pneumonia and pyæmia on 8th day; no hæmorrhage	Arendt, 1827; Dietrich's Collect., p. 188.
ture of innominata; about artery indu- and artery diseased; hæmorrhage during m and after liga- gging of wound	Dysphagia and dyspnœa; hæmorrhage	Death from hæmorrhage on the 5th day	Hall, 1830; Baltimore Med. Journ., No. 1, p. 128.
ture of innominata	Relief of pain and diminution of tumour; frequent and large V.S.; hæmorrhage on 17th day, recurrent	Death from hæmorrhage on the 18th day	Bland, 1832; Lancet, 1832-33, vol. i, p. 97.

No. of case. Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c
105. R.	M., 30, carter, fall on shoulder, fractured clavicle	Four months, small egg	Occasional pains, with cramp and tingling in fingers, wrist, and elbows; indistinct pulsation in arteries	Subclavian aneurism; no abnormal bruit over heart and aorta; in good robust health
106. R.	M.	— —	• — —	Case merely referred to; no detail
107. R.	M.	Large	— —	Aneurism of subclavian and carotid walls of the 2 aneurisms united by adhesions, forming one large-sized tumour
108. R.	M.	Large	— —	Aneurism of subclavian and carotid
109. R.	M., 52, baker, no cause	Small lump 2½ years, rapid increase during last six months	Acute pain, and could scarcely raise arm; pulse soft	Subclavio-axillary aneurism, stated to have commenced in axilla; was at first supposed to be an enlarged gland
110. R.	M., 46, squeeze of shoulder	Several years, of pigeon's egg	Pain in whole arm; pulses at wrists unequal	Subclavian aneurism; tumour tense and pulsating; 12 years ago had abscess about right clavicle, and aneurism lay in same place; heart's action normal; chronic cough
<i>Ligature of Innominata and</i>				
111. R.	M., 32, Mulatto, ship's steward, muscular exertion	Threemonths small orange	Severe pain and numbness in forearm and hand; pulse same at both wrists	Subclavian aneurism; unable to lie down or stand erect, and obliged to sleep sitting in chair, supporting head; aneurism increasing in size
<i>Ligature of first portion of</i>				
112. R.	M., 31, tailor, fall	Six months, hen's egg	Arm benumbed at times, temperature natural, pulse smaller	Subclavian aneurism; black eschar over surface of tumour, the remains of the effects of galvano-puncture which had been tried; had also taken digitalis
* R.	M., 24, dragoon, bayonet wound	Tolerable size, 2 months	Sharp, intolerable pains in course of brachial nerves	Subclavian aneurism, result of wound, which latter had perfectly healed
<i>Ligature of Subclavian, Caroti-</i>				
113. R.	M., no assignable cause	Seven months ago of size of walnut, and 5 months back size of hen's egg	Considerable pain, scarcely any pulse at wrist	Subclavian aneurism; rapid increase of size of late; had tried rest and a vegetable diet

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
Ligature of innominata	Pleurisy; ligature came away on 17th day, hæmorrhage on 20th, recurrent	Death from hæmorrhage on the 21st day	Lizars, 1837; Lancet, 1836-37, vol. ii, p. 445.
Ligature of innominata	—	Death from hæmorrhage	Referred to by Dupuytren, Leçons Orales, t. iv, p. 611.
Removal of inner end of clavicle and upper portion of sternum; ligature of innominata	Dyspnoea; retention of urine; pus found in right kidney	Death on 9th day; query, pyæmia	Cooper of St. Francisco; Amer. Journ., Oct., 1839; vol. xxxviii, p. 395.
Ligature of innominata and removal of inner end of clavicle and upper part of sternum	Went on well for several weeks, walking about room; secondary hæmorrhage; 34th day compress; tore off bandages	Death from hæmorrhage on the 34th day	Cooper, St. Francisco; the ditto, ditto, op. cit.
Ligature of innominata	Inflammation of left subclavian vein, and symptoms of pyæmia; sudden hæmorrhage on 17th day, and death in 40 minutes	Death from hæmorrhage on the 17th day	Gore; Bath Hosp.; communicated to Mr. Erichsen.
Ligature of innominata	Sero-purulent infiltration of wound; acute oedema of surrounding cellular tissue	Death in 48 hours after operation; pus in mediastinum and pericardium	Allgem. Kriegs-Chir., 1864, p. 459.
<i>Carotid; subsequently of the Vertebral.</i>			
Ligature of innominata and right carotid	Ligature came away on 14th day; hæmorrhage on 15th day, checked, but returned on 31st and on 51st days; vertebral tied on 54th day	Recovery	Dr. Smyth, 1864; New Orleans Med. Press, May 15, 1866; quoted in Biennial Retrospect, New Syd. Society, for 1865-66, p. 345.
<i>Subclavian and of Carotid Arteries.</i>			
Right carotid and subclavian tied	Went on well until 11th day, when hæmorrhage	Death from hæmorrhage on the 13th day	Liston, 1838; Lancet, July 12, 1838, p. 668.
Ligature of 1st portion of subclavian and carotid	Hæmorrhage on 7th day.	Death from hæmorrhage on 10th day	Cuvillier, 1860; Bull de la Soc. de Chir., Sér II, t. i, p. 130.
<i>and Vertebral Arteries.</i>			
Ligature of right subclavian, carotid, and vertebral arteries	Went on well until 10th day, when hæmorrhage, and checked; ligature of vertebral came away on 12th day, of carotid on 15th day, of subclavian on 24th day; 11 days after separation of last, there was return of hæmorrhage	Death from hæmorrhage on the 42nd day	Parker, 1863; Amer. Journ. Med., 1864, vol. xlvii, p. 562.

No. of case. Side.	Sex, age, occupation, and supposed cause.	Duration and size.	Condition of limb.	Peculiarities of symptoms, &c.
				<i>Ligat Bra</i>
114. R.	M., 40, day-labourer, violent exertion	Five months, 3½ by 2½ inches	Numbness and œdema, loss of motion, hand semiflexed, pulse same as opposite	Large projecting aneurism in part of neck, resting on clavicle, extending from sterno-mastoid to trapezius; undergone Valsalva treatment; increase
115. R.	M., 59, printer, no cause	Three months, small apple	Tingling in hand, whole limb engorged, pulse much more feeble than opposite	Subclavian aneurism on right neck; placed under regimen and ligated
116. R.	M., 39, finance comptroller, no cause	Six months, ½ an egg, now larger	Severe pain in arm, tingling in fingers	Large diffused aneurism extending from larynx to trapezius; subclavian; so chest normal; has had spitting of blood
117. R.	M., 32, negro, storekeeper, muscular exertion	Three months, obliquity of 4 inches	Constant pain and numbness in hand and arm; swelling; pulse weaker than other	Subclavian aneurism behind clavicle and prominent above and below; whole artery considered to be involved
118. R.	M., 42, white-washer, muscular exertion	Seven months, half large apple	Unalleviable pains shooting down arm to hand; no alteration in pulse	<i>Ligat</i> Globular tumour filling up space between trapezius and sterno-mastoid and clavicle
119. R.	M., 33, ship engineer, muscular exertion	Two years probably, only detected of late, fusiform	Rheumatic pains, cramp, and spasm in limb; œdema; threatening gangrene; pulse almost imperceptible; excruciating agony	<i>Amputat</i> Aneurism occupied whole track of subclavian artery; contents quite fluid
* L. Axillary.	M., 51, stone-mason	Several months, very formidable	Intolerable pain, entire loss of motion and sensation; arm double the normal size	Axillary aneurism, filling up axilla and threatening to burst

* See also Syme's case of amputation of shoulder-joint for axillary aneurism, Med.-Chir. Trans. 1840, vol. 25, p. 137.

Treatment.	Secondary effects, &c.	Result and cause of death.	Reference.
y Artery.			
re of commence- f axillary below	V.S. to large amount; on 7th day slight oozing; V.S. to large amount, causing prostration; coma supervened and delirium	Death from pros- tration from loss of blood	Dupuytren, 1829; Lancet, 1834-35, vol. i, p. 735.
re of axillary ar- vessels having to including the ax- illa and 2 other c then attempted acted but without	Two days after operation, separate puncture into sac, and injection of perchloride of iron; followed by hard- ening of tumour, and loss of pulsation; on 6th day, bronchitis and erysipelas; on 10th day, hæmorrhage from the ligature wound	Death from hæ- morrhage on 13th day	Petrequin, 1853; Gaz. Méd. de Paris, 1853, p. 805.
puncture twice i and failed; liga- xillary just below many arteries had	On 7th day, cerebral symptoms, and pulsation in tumour ceased; recovered in a few days; ligature came away on 21st day; hæmor- rhage on 24th day	Death from hæ- morrhage on 25th day	Schuh, 1858; Abhand- lungen, 1867, p. 582.
re of axillary as a possible	Went on well up to 18th day, and ligature had come away; acute broncho-pneu- monia supervened	Death on 19th day after operation; Ribs found eroded. No record of case	Canton, 1863; Med. Times and Gaz., 1864, vol. i, p. 8.
on to tie 1st por- subclavian, but diseased, as also sinata; hence sub- ligature of the carotid	Great irritability of sto- mach; went on well until 4th day	Death from sud- den prostration, a- bout 88 hours after operation	Butcher, 1863; Sur- gical Cases, p. 855.
ulder-Joint.			
station at the joint; artery tied aneurism becoming smaller laces, and some off site of aneu-	Progressed favorably; aneurism becoming smaller and smaller; disposition to coagulation slow	Left hospital on 44th day well, and with prospect of eventual cure; 4 years after he died suddenly from sup- posed internal aneu- rism	Spence, 1864; Med. Chir. Trans. for 1869.
re of 2nd portion ian; suppuration hæmorrhage on r; gangrene of putation of arm third	Hæmorrhage on 67th day; ligature of subscapu- lar; removal of head of humerus at joint	Recovery. Seen 1 year after in good health	Morton, 1866; Penn- sylv. Hosp. Rep., 1868, vol. i, p. 208, plate.

TABLES SHOWING CONDITION OF ARTERY, CONDITION OF SAC AND PARTS AROUND, AND CONDITION OF HEART AND ARTERIES, &c.

Cases treated otherwise than by Ligature.

Reference to No. of case.	Condition of artery.	Condition of sac and parts around.	Condition of heart and arteries.
1. Boucher	Aneurism occupied whole of subclavian from origin near carotid, extending to axillary; seemed to be a dilatation of the whole artery	Contents chiefly liquid blood; some large clots adherent to its walls and to cellular tissue about the sac. Second rib carious. Right lung adherent and shrunken.	
4. Neret	Aneurism occupied greater part of subclavian artery from origin to scalen; fusiform, swollen out in middle, 2½ inches in length	Inferior parietes of sac destroyed, and parts adherent to apex of left lung; communication with the arteries of the lung.	
5. St. Thos. Museum	Subclavian artery healthy from origin to external border of scalenus, but from this point to axillary dilated into an aneurism; proximal end only small aperture of artery into sac; distal end closed. The axillary artery for about one inch below sac flattened, and opposed surfaces of lining membrane covered with adherent lymph	Very large, sacculated, filling whole space between clavicle and scapula from spine to shoulder. Walls very thin, here and there clots. Clavicle eroded and fractured. Ribs were partly absorbed. The cavity of the sac would hold 5 to 6 pints.	
6. Walton	Tumour commenced at art. innominata, and involved all the branches given off from the subclavian; pouches at origin of the branches; contained considerable fibrinous deposits	Centre of first rib completely absorbed	Burst aneurism of popliteal artery. Atheromatous condition of femoral and popliteal arteries.
7. Ogle	Subclavian generally very dilated, along with arch of the aorta; both the seat of atheromatous deposits	Sac extended into axilla, compressing artery and vein. Summit ulcerated where it had burst. Clavicle and first rib carious, as also 2 lower cervical vertebrae	Extensive calcareous disease of the mitral valve.

Arteries healthy

Sac of the subclavian median half full of

Arteries healthy

Whole of

	ANEURISM.	ART. SUBCLAVIA. AND VEINS.	OTHER LOCAL DISPOSITION.
10. Colles	Aneurism commenced $1\frac{1}{2}$ inch from origin of vertebral and artery then dilated to $\frac{3}{4}$ of an inch; coats here thinned, and merging into the tumour. Branches of subclavian not at all enlarged.	Extended from clavicle to eighth rib, and from nipple to axilla. Articulation of humerus laid bare.	Heart small and healthy. Large vessels not dilated. Very small opaque spots on their internal coats.
12. Houston's Catalogue	Fusiform dilatation in 2 places; 1 at first rib, from posterior part of which a sac was formed, which passed down and pressed on pleura.	The second dilatation was a little lower down. Both aneurisms adherent to the vein.	
13. Vacca Berlinghieri	Subclavio-axillary dilatation on right side. Same on left side.	Left sac extended into axilla.	
16.	—	Large aneurismal sac of subclavian on right side.	Aorta much enlarged.
18. Guthrie	Artery sound for $\frac{3}{4}$ inch external to scapuli, where tumour formed, and extended $1\frac{1}{4}$ inch into axilla. Brachial below tumour smaller than natural.	Aneurism forced its way into right cavity of chest, by removal of 5 upper ribs. Adherent to lung and opening into it.	Aorta enlarged. Atheroma in aorta and right subclavian. Left subclavian natural.
19. Auchinloss	Dilatation of two thirds of innominata, whole of right common carotid, and first portion of subclavian; latter obliterated between scapuli, and again pervious external to it.	Posterior surface of sternum and inner half of clavicle eroded and absorbed. Upper lobe of right lung adherent to the posterior part of innominata.	Aorta greatly enlarged, and atheromatous deposits in it and innominata.
21. Clivier	Right subclavian enlarged as well as innominata, then ceased abruptly to a very small extent; afterwards the whole of subclavian entirely replaced by the aneurism; all branches of subclavian obliterated at their origin.	The aneurism composed of 3 portions: a suprascapular, rising as far as the third cervical vertebra and behind the angle of jaw; a second passed under clavicle towards axilla; the third filled the upper part of the thoracic region to the second rib. Internally it bordered on trachea and bronchus.	Heart large and hypertrophied; no disease of valves. Aorta enlarged and thickened. Much atheromatous and calcareous deposit.

Reference to No. of case.	Condition of artery.	Condition of sac and parts around.	Condition of heart and arteries.
23. Krackowitzer	Subclavian at origin from carotid dilated into sac of size of hen's egg, and from its posterior part the continuation of the artery passed off	Sac occupied only a short space of the artery, about $\frac{1}{2}$ of an inch, and had burst, forming the large diffused aneurism observed in the neck during life	Atheromatous degeneration of the aorta. Innominata of normal size; its coats relaxed, thickened, with patches of atheroma; carotid likewise.
24. Norris	Subclavian aneurism $1\frac{1}{2}$ inch in diameter. Axillary aneurism 3 inches in length; below this the brachial, $\frac{1}{2}$ inch in diameter	— — —	Arch of aorta and large vessels dilated and coats thickened. No satisfactory examination of popliteal artery, as advanced gangrene.
27. Jobert and Bourguery	Coats thickened and hypertrophied and no calcareous deposit found	From origin from arch of aorta to brachial on right side, a series of dilatations of subclavian and axillary arteries, separated by contraction into so many pouches.	
28. Bost. Mus.	Dilatation of half the calibre of the first portion of the subclavian to size of orange; coats diseased.		
29. St. Bart. Hosp. Mus.	— — —	Large aneurismal sac of first portion of subclavian; burst into the left bronchus.	
30. Hodgson	Small aneurism near its origin from aorta; artery emerging from it filled with firm, ligamentous substance. Arteries of subclavian much contracted and similarly filled	Sac filled nearly with layers of coagulum	Large aneurism of aorta, causing absorption of whole of upper bone of sternum.
31. Beauchêne	Subclavian dilated from origin to scalenus; obliterated, with its vessels, behind the muscle	Small sac from inferior side of third portion of subclavian resting upon first rib, and filled with dark grey clot	Aorta dilated to three times its natural size; with thickened coats and calcareous deposits.

	large. No evidence of lesion of lining coat	At the division of the innominate into subclavian and carotid, its internal coat is a little elevated by a fatty deposit.
<p>35. Calcutta Museum, No. 694</p>	<p>Aneurism sprang from artery at origin of thyroid axis, and did not extend to vertebral. The prof. cerv. branch issued from extreme external aspect</p>	<p>Aneurism of size of fist; had a ragged opening with everted edges of size of a rupee, through which fatal hemorrhage. Inside of sac more or less puckered, containing small quantities of lymph in distinct laminae.</p>
<p>36. Mus. R.C.S. Eng., No. 1691</p>	<p>Prep. of right subclavian artery with very small portion of sac of very large aneurism, which communicated with the artery near the giving off of the thyroid axis</p>	<p>The trunk of the subclavian, which is laid open, is quite healthy. The sac is lined with fibrinous coagula</p>
<p>* Sir W. Blizard, Mus. R.C.S. Eng., No. 1696</p>	<p>Right side, subclavian. Left, axillary aneurism</p>	<p>Axillary aneurism on left side; dilated arch of aorta and elongation, as also of innominate and right subclavian artery, axillary, and carotid. A small partial dilatation of right axillary. Vessels thickened and diseased.</p>
<p>* Guy's Hosp. Mus., No. 1486^m, Misc. Insp. Book, vol. v. p. 38</p>	<p>Aneurism on left side, size of small apple, in a male, set. 56</p>	<p>Aneurism of ascending aorta, as large as the heart; art. innominate involved. A second aneurism, as large as a small apple, involving the left subclavian. On inspecting the preparation, the aneurism does not involve the left subclavian artery, but is one of the aorta close to origin of the artery.</p>
<p>40. Oppolzer</p>	<p>Tumour extended above and below clavicle into axilla, pushing scapula back; vertebral artery compressed, as also commencement of being firmly adherent; apex of left lung adherent axillary, which contained a dark clot in its interior to sac; clavicle thinned and rough</p>	<p>Both ventricles enlarged; valves healthy.</p>

* These two cases are not tabulated with the others, although described as subclavian. They do not come under the present category.

Reference to No. of case.	Condition of artery.	Condition of sac and parts around.	Condition of heart and arteries.
44. Dupuytren	— — —	Subclavio-axillary. Two aneurisms; one formed by the subclavian, dilated to the extent of 2 inches; the other, the principal one, communicated with the former by a slit in the artery.	
45. Dr. Davis	Aneurism resembled a Polonisausage, formed from two-thirds of innominate, and nearly whole length of subclavian; artery at distal end for quarter of an inch quite impervious; of vessels given off from subclavian, only two discovered, and both impervious	Sac adherent to trachea, and opening into it by perforation; distal end of sac solid, with dense fibrinous coagulum; there was also small solid material at its posterior part; at the upper part, and about the opening of the carotid, a considerable cavity unoccupied by clot	Arch of the aorta not materially dilated, but numerous patches of atheromatous deposit.
46. Lawrence	Axillary portion of subclavian opened into the sac, about 1 inch from branches of subclavian; opening nearly circular. About 5 inches lower down was lower opening of sac, which appeared as a long, narrow slit, accounting for the feeble pulsation at the wrist	Sac of large size, containing 3 pints of recently coagulated blood, loose in the cavity; some fibrine of variable thickness adhering to the sides. It was a true aneurism, which had become diffused. Clavicle and surfaces of ribs denuded; the last had given way in two places; lung adherent to sac, and, in fact, formed part of the aneurism	Aorta, carotid, and subclavian entirely healthy.
53. Forbes	Lacerated opening, quarter inch large in 3rd portion of subclavian, near the inferior border of 1st rib; tumour of size of hen's egg, and adherent to the lung, breaking it down	Sac contained large clot, and walls consisted of external coat of artery only; the blood had dissected up the coats as far as origin of artery from innominate, and extended some distance up the branches given off by subclavian; pressure on innominate and carotid, the pneumogastric nerve and internal jugular vein	Slight degeneration of the aorta near celiac axis; small atheromatous deposits.
55. Porter	Sloughy aperture in innominate at site of pressure. Axillary artery at site of pressure narrowed, but not completely occluded	Tumour contained some layers of fibrine	Arch of aorta large, but not dilated into a pouch; a few atheromatous specks visible.
56. Fergusson	Axillary artery filled with firm plug of coagulum	Sac had given way at its posterior part, forming a mass of size of hen's egg, and including nerves;	

	Original aneurism had formed in the lower part of the subclavian as it becomes axillary	some recently coagulated aneurism	
59. Hilton		Tumour size of man's head; whole axilla filled with layers of fibrine; walls of chest quite bare, ribs eaten away; opened into cavity of chest, filling it with coagulum; lung compressed towards spine; clavicle eroded, as also under part of sternum	Body otherwise healthy; heart, aorta, and other arteries healthy.
61. Sir A. Cooper	Sac large, and clavicle thrust very much up; much violence to soft parts, and supposed injury to thoracic duct	Sac contained large coagula of blood; 2 first ribs destroyed; lung adherent to sac	Aneurism of femoral artery below Poupart's ligament.
63. Key	Innominate immediately after origin dilated to whole extent, and involving subclavian. Sac contracted where passing between scaleni, and then dilated into a thumb-like process	Sac filled with firm, dense coagula, leaving a small passage for blood; this supposed to have occurred after attempts at operation; trachea pressed upon	Heart and valves normal; ascending and descending aorta studded with cartilaginous and atheromatous deposits; small aneurism in descending aorta; carotid healthy.
64. Hoffman. N. Y. Museum	Two sacs; one of the subclavian above 1 inch in diameter, beginning 1 inch beyond origin of large branches; the other immediately beyond was 6 inches in diameter	Sacs contained layers of coagula, and they involved in their walls the brachial plexus. Axillary artery emerged 2 inches beyond sac	Numerous atheromatous deposits in aorta and innominate, with simple enlargement of latter.
65. Cusack	Subclavian pushed forwards; it was impossible to pass needle round it without entering the sac	Sac had burst into the axilla; large mass of coagulated blood filled axilla, extended along clavicle and sternum, diffused among muscles and tissues around	Art. innominate and left carotid presented numerous small aneurismal dilatations. Adherent pericardium.

Cases treated by Ligature of Third Portion of Subclavian.

No. of case, date of death, after ligature.	Condition of aneurismal sac, &c.	Proximal end of ligatured artery	Distal end of ligatured artery	Condition of heart and arteries, &c.
68. Colles. 5th day	Sac intimately adherent to thorax, the latter forming in part its wall; second rib eroded. Aneurism extended as far as to where the ligature had been applied	Thrown into folds or furrows; internal coat only ruptured at one part by the ligature in one fourth of its calibre; 2 small portions of clot above ligature; branches of subclavian not at all enlarged	Rather small	No disease in any of the valves of heart; state of large vessels not mentioned.
69. Travers. 4th day	Sac nearly empty. The ligature had been applied just on root of sac; the latter had a pouch-like enlargement upwards, which overlapped the artery, and had been penetrated by the aneurism needle	—	—	Pleurisy; 20 oz. of serum in chest; lungs healthy.
70. Brodie. 6th day	Sac fusiform, 5 inches long and $2\frac{1}{4}$ inches broad, with dilatation of third portion of subclavian up to and beyond ligature. Sac occupied by fibrinous coagulum. Purulent infiltration and thickening in parts about the wound	Occupied by fibrinous clot, and artery greatly dilated	Artery dilated into the aneurismal sac, and contained recent coagulum	Heart hypertrophied; arch and descending aorta greatly dilated, and had atheromatous and calcareous deposits.
71. Auchincloss. 3rd day	Ligature had been applied $\frac{1}{4}$ inch from thyroid axis. The aneurismal enlargement began at exit of artery from between scapuli, and gradually increased until below clavicle; it was $2\frac{1}{4}$ inches in diameter, remained thus to lower part of axilla, then suddenly merged into a natural-sized axillary artery	Thickened and enlarged; with small deposits; plugged with adherent coagulum	Coagulum also formed, and adherent	Aorta and large vessels dilated; inner coats thickened and rugose, with atheroma here and there.

	the sac was very small	arterial branch		off.
74. Blaker. 12th day	Artery dilated $\frac{1}{4}$ of an inch from where ligation applied, into sac, which extended chiefly into the axilla. Large clot in sac, with fetid, grumous fluid. The 2 upper ribs were eroded.	Artery healthy up to ligation, and then sloughy, having a large opening, and containing small, unhealthy-looking clot	In sloughy state, as also all parts around; it contained fetid, grumous fluid in its interior	Slight atheromatous deposits, in subclavian, increasing towards heart; aorta and pulmonary arteries enlarged; valves thickened.
75. Paget. 65th day	Sacs above and below clavicle had both suppurated, that above clavicle of size of orange, that below of size of 2 fists. Artery between the two lying upon the first rib, and quite pervious. Brachial very small, but coats healthy. Left shoulder full of thick pus. Elbow-joint denuded, and cartilage gone	Coats of artery here and there atheromatous, and contained pale fibrinous clot; so also the carotid	Firm clot at seat of ligation; occlusion	Heart large and flabby; aortic valves thickened and ossified; coats of aorta thickly studded with patches of atheroma; vein free from inflammation; small purulent deposits in right lung.
78. Liston. 14th day	Aneurism extended from scalenus, and occupied whole axilla, having part of subclavian stretched over it. The vessel had given way just below origin of the thoraco-humeral artery. Brachial below tumour small and completely filled with coagulum. Aneurismal sac had been punctured in the first deligation, and was the source of the hæmorrhage	No appearance of reparation; subclavian artery was like the finger of a buckskin glove	No trace of reparation	Diseased arterial coats.
83. Jobert. 29th day	Fusiform, of size of turkey's egg, extending $\frac{1}{2}$ inch from external border of scalenus to origin of the circumflex artery. The whole subclavian cavity was of the size of aorta. The sac contained black, soft, grumous clots; lower end plugged with firm red clot as it emerged into axillary artery. Extensive suppuration among muscles	Both ends of artery plunged into a large pyæmic cavity; no clot therein; ends remaining open	Patulous; no clot	Arch of aorta, innominate, and subclavian, all dilated; much atheroma; small aneurism of innominate protruding by side of sternum; atheroma in femoral artery.

No. of case, date of death after ligature.	Condition of aneurismal sac, &c.	Proximal end of ligatured artery.	Distal end of ligatured artery.	Condition of heart and arteries, &c.
84. Gregg. 10th day	Sac adherent to 4 first ribs, contained 12 oz. of black, semifluid, decomposing blood. A firm coagulum, of size of walnut, occupied the opening of the artery into the sac. Large abscess, extending from wound downwards, also backwards under trachea and arch of aorta, to second and third dorsal vertebrae. Enlarged liver pressing up as far as fourth rib, and diminishing cavity of thorax	Ligature had not completely cut through the artery, and coagulum firmly adherent to coats at this spot. Proximal end had a firm coagulum 1 inch long, and strongly adherent to coats	Internal mammary artery opened close to distal side of ligature, and may have been the source of a hemorrhage	Heart hypertrophied and valves healthy; aorta of natural size, as also the innominate, the latter having atheromatous deposits.
85. Seutin. 35th day	Tumour filled with fibrin; part of sac projected into chest. Second rib rough, and in part destroyed. Sac adherent to pleura. Much infiltration and suppuration in parts around. Brachial artery of ordinary calibre and natural. Branches of brachial plexus, especially that forming median nerve, were intimately adherent to the aneurismal sac	No appearance of clot; no blocking-up; much infiltration and alteration in texture to extent of 2 inches toward aortic portion; all collateral branches considerably enlarged	Two lines from ligature a roundish opening, at least 2 lines in diameter, probably from corrosion by the pus	Traces of old infiltration in ventricles; arch and thoracic aorta more than double natural size; left side of arch had a large growth of size of pigeon's egg; old adhesion of left lung to diaphragm.
89. Colles. 9th day	Aneurism only $\frac{1}{4}$ of an inch from origin of artery from innominate; sac extended from sternum-mastoid and along clavicle. Apex of right lung adherent to parts in vicinity of the ligature. The ligature lay at some distance from where it was applied	Not above quarter of an inch of artery free from disease. A pretty large opening in coats from ulceration	Ulcerated opening	Innominate dilated and diseased, and pouch-like dilatation in arch. Aorta atheromatous.
91. Hayden. 12th day	Sac extended as far back as the scalenus, and was situated in the front part of the axilla; surrounded by the brachial plexus. Cavity filled with laminated coagulum. The ligature was	Gaping open, and no appearance of coagulum or attempt at reparation	Gaping open $\frac{1}{4}$ of its calibre. No coagulum	Right carotid much enlarged. Inflamed bronchial membrane.

Cases treated by Ligature of First Portion of Subclavian.

	in its first stage. Divided extremities of ligamentary artery 2 inches apart, and separated by coagula	No clot in the artery	No clot in the artery or any of its branches	coracoclavicular concavity of sternum presented a spot of atheromatous deposit.
93. Partridge. 4th day	Sac contained coagulated blood, but no fibrinous deposits; walls in some places exceedingly attenuated. Three small deposits of pus near wound and along anterior mediastinum	Completely filled with coagulum, but did not reach 2 lines beyond the extremity	Quite healthy and pervious, no attempt at clot or any adhesive process. All arteries arising from subclavian pervious	Heart, aorta, innominate, and carotids healthy. Veins not inflamed. Recent layer of lymph in pericardium. Old pleuritic adhesions.
94. Liston. 36th day	Sac of size of pullet's egg, extending from scalenus to upper margin of second rib, where it ceased suddenly, and from which a healthy axillary artery continued on. Coats of sac extremely dense	Artery formed around, solid cord, 1½ inches long and im-pervious. Contained firm fibrinous clot, adherent for ¾ of an inch. Coats thickened, and had a patch of atheromatous deposit. The branches healthy and patulous	No other plug than a soft coagulum of blood. Orifice of vertebral open, and contained a thin, broad coagulum, just formed before death	Carotid pervious, and had a dark, sloughy appearance at one point. Subclavian came off behind carotid on a deeper plane.
95. Rodgers. 15th day	Sac commenced half an inch from thyroid axis, and of size of small orange; it involved part of scalenus and cervical nerves; was completely blocked up with coagulum. Axillary artery emerged at distal side, and plugged with fibrinous clot. Ligature applied close to vertebral, 1½ inches from origin of subclavian, on cardiac side of vertebral	Oblong caudate clot, size of pea, which obliterated cavity of artery	No clot. Artery gave way near its branches	Considerable atheromatous deposits in aorta. Heart somewhat large, but sound.
96. Auvart. 11th day	Pleura and lung adherent to parts about the ligature, and involved in suppurative process	—	—	Heart, aorta, and large vessels normal.
97. Arendt. 5th day	Sac contained lamellæ and blood coagulum	—	—	Right lung full of tubercles, some suppurating. Pus in anterior mediastinum. Liver enlarged and cirrhotic.

No. of case, date of death after ligature.	Condition of aneurismal sac, &c.	Proximal end of ligatured artery.	Distal end of ligatured artery.	Condition of heart and arteries, &c.
98. Bayer. 24 hours	Diameter of tumour both ways measured over 8 inches. Sac contained 2 ounces of coagulated blood, and several ounces of stinking fluid. Sac adherent to ribs, and right lung adherent also, preventing extension of aneurism into chest. Caries of second and third ribs. Pectoral and serratus muscles matted together. Middle of subclavian artery opened into the sac, and was the cause of the diffused aneurism	Ligature tightly applied near the origin of vessels	—	The sac had burst into the wound, having a rent of several lines at its upper part.
* Auvert. 22nd day	Lung and pleura adherent to parts at site of operation. Much suppuration round about ligature	Artery perfectly healthy, obliterated by smooth clot, of size of lentil	Fimbriated rupture in a longitudinal direction, near branches of subclavian	
<i>Cases treated by Ligature of Innominata.</i>				
99. Mott. 26th day	Sac of small size; clavicle involved in it, and found carious and entirely disunited at its middle. Several coagula of blood in sac. Large ulcerated cavity at seat of ligatured spot, and much more extensive at depth of wound, and involving the tripod of large vessels running from arch. Extremities of carotid and subclavian found to open into the cavity of the ulcer.	Internal coat smooth and natural, but for $\frac{1}{4}$ inch below where ligature had cut, and through artery there was a coagulum adhering with considerable firmness to one of its sides; an effort of nature and extending up to bifurcation to plug up vessel; the rest, no doubt, swept away by destructive process of ulcer-admitting probe; subclavian gave off an anomalous branch $\frac{1}{2}$ inch from aorta to left arm	Considerably diminished in diameter by thickening of coats; internal part of inflammation or its consequences.	Arch of aorta and origin of tumour had no vestige of inflammation or its consequences.
102. Arendt.	Subclavian artery from origin to sac enlarged, and signs of inflammatory redness. Size of ordinary artery.	Ligature tightly applied, and had cut through the	Carotid and subclavian	Puriform inflammation among

8th day	nary fist. Contained dark grumous blood and laminae of fibrin. Seated upon first and second ribs, and latter partly absorbed. Nerves and veins adherent	inner coats		bronchus; lower lobe of right lung congested, and lymphatic exudation.
103. Hall. 5th day	Sac contained a large dense clot. Subclavian artery thinned as approaching sac. All parts in neighbourhood of wound intimately united together	Ligature had remained in its place, having been passed through 2 openings in thickness of coats of innominate	Carotid artery seemed to extend upwards as whitish cord	Arch of aorta at least half as large as natural; its inner coat, as well as that of innominate, carotid, and subclavian, beset with atheromatous deposits, and all dilated; nothing remarkable in heart, and valves slightly thickened; old pericardium.
104. Bland. 18th day	—	—	Two thirds of innominate become closed by solid coagula; carotid artery closed through its entire extent by solid coagula; subclavian from commencement to aneurismal sac pervious, and also enlarged, and coats thickened; axillary artery pervious, and contained no coagula.	
105. Lizars. 21st day	Twenty oz. of coagulated blood in wound and at root of neck, extending into pleural cavity, pressing down lung. Sac collapsed and full of coagula. Art. innominate separated at seat of ligature	Some coagulated blood extending a very short way	Coagulated blood extending upwards and into the right carotid, and some into the commencement of the subclavian; all branches from subclavian pervious, and without any coagulum.	

No. of case, date of death after ligature.	Condition of aneurismal sac, &c.	Proximal end of ligatured artery.	Distal end of ligatured artery.	Condition of heart and arteries, &c.
109. Gore. 17th day	Sac very much contracted and quite filled with coagula, and clot extended from sac into subclavian and brachial arteries. Large cavity filled with pus extended into mediastinum, burrowing under sterno-mastoid	Not at all contracted, and was partially plugged with clot	Carotid patulous; innominate cut through	Heart healthy; aorta roughened by atheroma; left subclavian vein inflamed and blocked up.
110. Pirogoff. 48 hours	Sero-purulent exudation about ligature, and acute purulent œdema in anterior and posterior mediastinum	Ligature firmly applied	—	Extravasated blood in fore part of surface of pia mater on both sides; membranes telematous and hypertrophied; fresh puriform exudation in right pleura; acute œdema and pneumonia of lung.
112. Liston. 42nd day	Sac much shrunken, size of walnut, and firm. Slough from external wound had extended down to its walls, which were here much thinned. Sac firmly adherent to surrounding parts	Innominate shrunken and plugged with firm adherent coagulum; subclavian still connected with innominate by a small portion of ligature not yet separated; no coagulum in vessel, which open and free	Carotid separated from innominate and plugged from point of bifurcation to the ligature; subclavian and its arteries all open	Pericarditis; blood and pus in ant. mediastinum.
* Cuvillier. 10th day	Large aneurismal tumour of elongated form, divided into two lobes, and subclavian artery lodged there in depression. Further observations prevented, as it was made a dry preparation	Subclavian plugged	Carotid obliterated; subclavian not plugged, and its vessels quite permeable to blood	Purulent collection in wound and between lung and pericardium; right side of chest filled with large quantity of blood.
113. Parker 42nd day	Sac larger than hen's egg, and nearly filled with coagulum. Axillary artery beyond it healthy and unobstructed	Innominate firmly plugged; subclavian open	Carotid and vertebral plugged on distal side of ligatures; subclavian open coagulum, except distal side and ulcerated away, carry-off of subclavian and proximal	In fact, all the vessels concerned were filled with coagulum, except distal side of subclavian and proximal

... arising from wound of artery.

			end of vertebral	
114. Dupuytren 9th day	Sac contained but few clots; it consisted of a dilated subclavian artery. Axillary artery sound. First and second ribs on right side absorbed, and at one part entirely	Small clot, and opening into artery at seat of ligature, probably due to traction in examination; vertebral, internal mammary, inferior thyroid, all found obliterated	No trace of coagulum in artery at site of ligature; artery healthy, and inter-arterial coat found not completely divided; ligature still attached	Thoracic aorta greatly enlarged, thickened and calcareous; innominate diseased; subclavian diseased from commencement to end; right pleura inflamed, as also lung; heart large, flabby.
115. Petrequin. 10th day	Sac considerably diminished and curved upon itself, filled with clot and some pus. The walls inflamed. Site of punctures inflamed, and sinuous track leading to sac. Wound bathed in pus, the matter extending under deltoid to arm, and under pectoral muscles to chest	Ligature had been thrown off by sloughing	Hæmorrhage probably from distal end, the pre-mature giving way of artery	Subclavian and axillary arteries not altogether healthy.
116. Schuh. 25th day	Sac occupied third and second portions of subclavian. Separation of artery at site of ligature. Ribs formed under part of sac, and were eroded. The diffused blood had reached dorsal vertebrae to extent of a man's head. Right lung compressed	Cord of vessel fallen together, and contained dark brown clot: was the source of hæmorrhage; no clot in vertebral or other vessels	Firmly plugged up by fibrinous clot	Innominate thickened, as also valves of heart; atheromatous deposits in aorta; in left internal carotid at base of skull a loosely adherent yellow brown fibrinous clot.
118. Butcher. 88 hours	Subclavian from art. innominate dilated and thickened in its entire first and second stages, and looking more like an aorta; it then thrust out into a large pouch in the posterior triangle of neck. Sac contained layers of fibrinous coagulum and recent clot filling up and blocking axillary artery, which latter was quite healthy	Clot extended from tumour inwards, nearly filling entire calibre of diseased and dilated subclavian; clot reached to upper end of innominate; no clot in carotid below ligature; no clot in art. innominate	—	Arteria innominate enlarged, with coats thickened, and abundant atheromatous deposits.

Remarks.—I will now enter upon the several points which must interest the surgeon on the mode of origin, and on the treatment of subclavian aneurism. The materials supplied, although so numerous, are in part extremely meager, but yet they are sufficient to enable us to draw some conclusions which may be used with advantage.

1. *With regard to the frequency of subclavian aneurism.*—I am not able to offer any statistical deductions in respect to its frequency in comparison with aneurism of other arteries. Suffice it to say, that it is generally considered to be as frequent as carotid aneurism, and to hold an intermediate place between this and aneurism of the innominate. The position of the subclavian artery, just where the moveable upper extremity, in its varying movements, acts upon a more or less fixed first rib, over which that vessel glides, would lead one to anticipate a disease such as aneurism to be more frequent in it, than in any other artery under a morbid condition of the arterial tunics. Yet notwithstanding all the varied efforts and exertions made by the upper extremity, which must influence the domains of the subclavian vessel, still how rarely and how unfrequently do we find the tube giving way and becoming the seat of aneurism! We may, therefore, fairly presume, that something more than actual position, and even actual injury, must be requisite to give rise to such a morbid formation.

2. *The side of the body in which the disease is most prevalent.*—It has been surmised that subclavian aneurisms are more frequent on the right than on the left side, in consequence of the greater use of the right arm, and the exertions which it performs; and this seems to hold good, although in one case, No. 94, the aneurism was on the right side in a left-handed individual, and there were two cases in which the aneurism involved the arteries on both sides, see Nos. 13, 26.

Thus—

On the right side there were.....	85 cases.
" left side "	28 "
On both sides "	2 "
The side is not stated in	5 "
	<hr/>
	120 "

3. *The sex also has been taken into account, it being more frequent in males than females.*

	Right.	Left.	Both sides.	Side not stated.	Total.
Males	74	22	3	1	100
Females	8	3	—	—	11
Sex not stated ...	3	3	—	4	10
Total	85	28	3	5	121

4. *The age at which the subclavian aneurisms have been observed, whether due to mechanical lesion, or occurring without any assignable cause ;—we shall separate the males from the females thus :*

A. *Of the females there were—*

2 at 21 years of age	Nos. 76, 90
1 " 28 "	No. 17
1 " 30 "	" 79
1 " 46 "	" 63
1 stated to be middle aged.....	" 28
1 over middle age	" 31
1 at age of 57	" 91
1 " 60	" 2
1 " 65	" 60
1 " 69	" 44

—
11 cases.

B. *The ages of the males are recorded in 79 cases out of 98—*

1 at age of..... 21	7 at age of..... 40	6 at age of..... 50	3 at age of..... 60
2 " 30	1 " 41	3 " 52	1 " 61
2 " 31	4 " 42	1 " 53	1 " 63
3 " 32	4 " 43	1 " 54	1 " 64
3 " 33	3 " 44	3 " 55	2 " 65
1 " 35	3 " 45	1 " 57	1 " 66
3 " 36	2 " 46	2 " 59	1 " 73
2 " 37	3 " 47		
3 " 38	1 " 48		
4 " 39			
24 under 40 years.	28 from 40 to 49 years.	17 from 50 to 59 years.	10 cases over 60 years.

5. *The countries in which the aneurisms have been notice operated on, or recorded.* This statement is merely introduced to show how great a majority of the cases have occurred in Great Britain, and opens a question as to the prevalence of aneurism in this country. I have introduced the name of the operator as recorded, and have affixed to each case a number corresponding with that in the tables :

ENGLAND, 45.		Cusack	65	GERMANY, 6.	
Brodie	No. 70	Butcher	118	Bayer	
Blaker	74	Hayden	91	Griesinger	
Bullen	80	Hobart	88	Langenbeck	
Burton	5	Gregg	84	Graefe	1
Cooper, Sir A.	61	O'Reilly	92	Oppolzer	
Cooper, B. B.	73	5, Porter	11, 12, 55, 62, 87	Schuh	1
Corner	49				
Canton	117	SCOTLAND, 7.		FRANCE, 16.	
Davis	45	2, Auchinloss	19, 71	Abeille	
2, Fergusson	56, 57	Allison	26	Beauchène	
Guthrie	18	Liston	78	Boucher	
Green	77	Lizars	105	Clavier	
2, Gore	81, 109	Spence	119	Cloquet and Bernardin	
Heath	12a	Wishart	86	3, Dupuytren	44, 10
Hilton	59			Guérin	
3, Hodgson	2, 3, 30	AMERICA, 16.		" fils	3
Holmes	8	Forbes	53	Hist. de l'Acad.	
Key	63	Hall	103	2, Jobert	27, 8
2, Lawrence	46, 66	Hoffmann	64	Maisonneuve	
Little	58	Krackowitz	23	Neret	
2, Liston	94, 112	3, Mott	54, 90, 99	Petrequin	11
Lloyd	47	Museum, Boston	28		
Museum, St. Bartholomew's	29	Norris	24		
2, Museum, St. Thomas's	32, 33	Parker	113		
Museum, Hunter's	36	Pencoast	43		
Nicholls	76	Rodgers	95		
Norman	101	Smyth	111		
Ogle	7	3, Warren	50, 51, 79		
Paget	75				
Partridge	93	ST. FRANCISCO, 2.			
Poland	52	2, Cooper	107, 108		
Skey	72				
St. Thomas's Hosp.	67	1, CALCUTTA MUSEUM	35		
Travers	69				
Walton	6	MALTA, 1.			
Wardell	22	Sent to Chatham Museum	34		
Wardrop	17				
Yeatman	38				
		SYDNEY, NEW SOUTH WALES.			
IRELAND, 15.		Bland	104		
Adams	9				
3, Colles	10, 68, 89				

England, Scotland and Ireland, have yielded 67 cases. A other countries 54 cases.

6. The occupation of those affected with subclavian aneurism.—

Of the 11 females in only 1 was there any occupation traceable in connection with the disease. Case No. 63 is that of a woman, æt. 46, who was a greengrocer's wife, and accustomed to lift heavy weights in her business, and she laboured under extensive atheromatous disease of the arteries.

Respecting the occupation of the males, the returns are anything but satisfactory, as in many instances it is not mentioned;—however, this is not of much importance, as will be seen by the subjoined particulars of those recorded. The disease is not associated with any particular trade or occupation; and laborious avocations, as those of blacksmiths, carriers of heavy weights upon the shoulders, soldiers, sailors, &c., are not more common among sufferers from this disease than less active employments. The following have their occupations mentioned:—2 clergymen, 1 merchant, 1 clerk at a wharf, 3 soldiers, 2 sailors, 1 shipwright, 1 steward of a ship, 5 porters, 12 labourers, 2 carters, 4 stablemen and ostlers, 2 farmers, 1 tailor, 1 polisher of iron weights, 1 weaver, 1 barge navigator, 1 hay-binder, 2 ropemakers, 1 engine maker, 1 printer, 1 pedlar, 1 coachman, 1 fishmonger, 1 huntsman. 2 were negroes, 1 mulatto, and 1 albino. The occupation appears to be neither a predisposing nor an exciting cause, and this tends to show that the cause is much more general, viz., injury, to which all are liable,—or disease of the arterial system, to which all are equally prone under particular morbid circumstances. Few of the sufferers attributed the disease to their occupation, but rather referred it to some antecedent injury or blow, or to some affection, such as rheumatism, syphilis, &c.

Thus we find the causes given by the patients in the following list, using their own terms for our purpose:

6, Direct violence and contusion—Nos. 15, 17, 80, 98, 46, 102.

14, Repeated and prolonged exertion—Nos. 7, 14, 22, 38, 50, 51, 53, 89, 93, 109, 114, 117, 119, 73.

2, Straining with arm above head, as in whitewashing, &c.—Nos. 8, 118.

7, Falls, straining in falling, or falling with arm stretched out—Nos. 68, 76, 78, 90, 99, 105, 112.

1, Rolling heavy packages—No. 21.

1, Sudden jerk—No. 59.

1, Squeeze—No. 110.

2, Carrying weights on shoulder—Nos. 19, 95.

- 4, Carrying weights, attached by cord over shoulder or around the neck as yokes, knapsack, &c.—Nos. 4, 82, 83, 58.
- 1, Drawing cork from bottle—No. 79.
- 5, Lifting up heavy weights—Nos. 18, 39, 43, 24, 63.
- 2, Inordinate exercise—Hunting—No. 12.
- 1, Sudden twisting of head—No. 16.
- 2, Attempts at reduction of dislocation of shoulder—Nos. 44, 96.

In several it was attributed to general diseases :

- 8, Rheumatism—Nos. 45, 48, 66, 74, 75, 78, 84, 86.
- 5, Syphilis—23, 39, 41, 42, 85.

And in others again no assignable cause could be traced. This then brings us to the next important paragraph.

7. *The cause of subclavian aneurism.*—This will require much consideration and elucidation. I propose therefore to enter into this subject most fully ; and although it necessarily involves much reiteration and space, yet I feel satisfied that the extensive analysis I have made will tend in some measure to assist us in our endeavours to ascertain the predisposing and exciting causes of subclavian aneurism. It is not only important in a pathological point of view, but it is essential for our guidance in the treatment of the affection. If we can satisfactorily prove that to produce a subclavian aneurism there must be a pre-existing morbid condition of the coats of the artery, we can easily comprehend why ligature of the vessel for the cure has so signally failed. If, on the other hand, the disease is found to have originated from a local cause, acting upon a healthy vessel, we may then presume that we have a legitimate sphere of action in proposing operative measures. Now in order to gain our object, we must take into account every possible circumstance, not only the assigned and apparent causes, but also such other points as the age, sex, habits of life, previous diseases or injuries, &c. ; although these are by no means essential, yet they complete our investigations, in most materially clearing up doubtful points.

Our tables are by no means perfect : were they complete in every detail, we should arrive at some strict and definite conclusion ; but unfortunately, in a majority of the fatal cases, no account is given of the condition of the arterial system, or even of the subclavian artery itself. Observers have been more intent upon searching for the source of hæmorrhage and

want of plugging in the proximate and distal ends of the ligatured vessel, than upon the existence of disease of the arterial coats themselves, although when carefully looked for this has in the majority of instances been found to be the true cause of failure of the operation.

The word "spontaneous" is perhaps an erroneous term; but by it I mean to convey the fact, that there is no assignable cause for the formation of the aneurism; thus in many instances the patient accidentally discovers the tumour, without any other forerunner than a rheumatic pain; and again, in others, the tumour is first discovered by the surgeon, without the patient being in the least aware of its presence.

In analysing the causes in these 120 cases, we shall adopt the following division:

CLASS I.—SPECIMENS OF THE DISEASE, with no history attached, and therefore of little use otherwise than evidence of atheromatous disease. The cases are Nos. 20, 29, 32, 33, 34, 35 and 36. Of these only three seem to have been of an idiopathic rather than a traumatic origin.

CLASS II.—Cases in which death took place, and a post-mortem examination was made, and the condition of the vessels was observed.

Section *a*. Arterial vessels found atheromatous, 30 cases.

„ *b*. Aneurismal dilatation of the subclavian, arch of the aorta, &c. . 14 „

„ *c*. Arterial vessels found healthy . 4 „

CLASS III.—Cases in which death took place, and a post-mortem examination was made, but the condition of the vessels is not stated . . . 19 „

CLASS IV.—Cases in which death took place, but no post-mortem examination was made . . . 14 „

CLASS V.—Cases in which recovery took place . 30 „

CLASS VI.—Cases in which the result was unknown 2 „

Let us now take these several classes into consideration. I have tabulated them together by referring to the number

in the tables, the side, sex, age, occupation, supposed cause during life, and the duration when first reported.

CLASS I requires no further comment.

CLASS II.—Section *a*. *Thirty Cases examined, and Atheromatous Disease found to exist.*

No. and side.	Sex.	Age.	Occupation.	Cause.	Duration.
R. 6.	M.	66	Gentleman	No cause	3 years.
R. 7.	M.	50	Labourer	Straining while at work	2 years.
R. 8.	M.	45	Plasterer	Working with hand above head	6 months.
R. 10.	M.	55	Soldier	—	—
R. 18.	M.	33	—	Lifting weights	1 year.
R. 19.	M.	64	Plumber	Carrying lead on shoulders	14 months.
R. 21.	M.	60	—	Rolling heavy packages (epileptic)	5 months.
R. 23.	M.	40	Musician	Syphilis	Few days.
R. 28.	F.	middle-aged	—	—	—
R. 31.	F.	middle-aged	Princess	Found at post-mortem; unknown	—
R. 45.	M.	43	Labourer	Supposed rheumatism	8 months
R. 53.	M.	36	Farmer	Muscular exertion	3 weeks, called traumatic.
R. 63.	F.	46	Greengrocer	Lifting heavy weights	3 weeks.
R. 64.	M.	63	Negro	Spontaneous	5 months.
R. 70.	M.	50	Stableman	Ditto	—
L. 71.	M.	65	Weaver	No injury	18 months.
R. 74.	M.	59	Haybinder	Rheumatism	2 years.
R. 75.	M.	54	Soldier, aged look	Ditto	4 months.
R. 78.	M.	43	—	Ditto; fall on ice with arm stretched out	9 months.
R. 83.	M.	61	Carrying weights with yokes	Sawyer of wood	6 months.
R. 84.	M.	40	Soldier, porter	Rheumatism	3 months.
L. 85.	M.	42	Labourer	Syphilis	—
R. 89.	M.	33	Labourer	Muscular exertion	5 months.
R. 92.	M.	39	Stable-helper;	Spontaneous (intemperate)	3 months.
L. 95.	M.	42	Labourer	Carrying weight on shoulder	4 weeks.
R. 103.	M.	52	Labourer	No cause	—
R. 109.	M.	52	Baker	Ditto	3 years.
R. 114.	M.	40	Labourer	Violent exertion	5 months.
R. 116.	M.	39	Clerk	Spontaneous	6 months.
R. 118.	M.	42	Labourer	Whitewashing ceiling	7 months.

I have thought it advisable to give the published account of the origin and cause of each recorded case.

CASE 6.—A gentleman, *æt.* 66, was attacked with pain of a neuralgic character in the arm, forearm, and hand of the right side in the spring of the year 1851; and having sought relief in vain in the country, he came to town and consulted many physicians and surgeons, but no benefit accrued. In the latter part of 1851 he came under Mr. Walter for an ophthalmic affection, still suffering from incessant pain over the entire member from the shoulder downwards. No rest at night without large doses of morphia. No part of the extremity was swollen, nor was there any atrophy, although muscular force was diminished, he being unable to grasp or hold firmly as with the other hand. On careful examination Mr. Walter failed to detect any tumour or other mechanical cause of the disease. After this period he travelled about, and in November Mr. Walton was called upon to tie his femoral artery.

CASE 7.—Labourer, *æt.* 50. Some two or three years back suffered from shortness of breath in consequence of a strain while at work, which caused him to throw up a quart of frothy blood. Ever since he had been subject to dyspnoea, but went on with his work, until one year before his admission. At that period he caught cold, and his dyspnoea became more urgent, and he had great pain in the elbow of the right arm. He also became subject to giddiness, and swelling and numbness of right arm and hand.

CASE 8.—A plasterer by trade, in the constant habit of working with the arms raised above the head. Six months before admission he felt a little pain in the right shoulder, accompanied by slight pulsation about the collar bone. The pain was severe for two days, but subsided under the use of embrocations. He noticed nothing further about the pulsation.

CASE 18.—About one year ago felt a severe pain in his right shoulder when making great exertion in lifting a weight, and on putting his hand to the part, he discovered a small, hard, pulsating tumour under the collar bone.

CASE 19. *Auchinloss*.—A plumber, much exposed to changes of temperature, and frequently in the habit of carrying heavy loads of lead upon his shoulder. About a year ago became affected with rheumatic pains in the shoulder, he being subject to attacks of rheumatism, and had a tumour forming. Seven months after this he fell from a scaffolding two stories high, alighting on his feet, but spraining the ankle, and received a very considerable jerk, after which the tumour began to enlarge.

CASE 23. *Krackowitzer*.—*Æt.* 40, originally of robust constitution; had a fine voice, was attached to one of the glee clubs, was very frequently up late at night, and had indulged in the use of strong beverages. Some years ago he performed on the trombone. A few years ago he contracted syphilis, and had occasional attacks of eruption. Notwithstanding all this, his constitution kept up very well until two years ago, when he became languid and sick, and troubled with a cough. He still continued his vocation, until ten months ago, when he was taken with hoarseness, almost amounting to aphonia. He never recovered his voice, and the symptoms were considered to be due to laryngitis. During all this time he continued to perform on wind instruments without any difficulty. About the last day of October his band marched with a regiment to Washington, and since then he did his duty in camp as a musician up to eight or ten days before his death. About that time he noticed a little swelling in the subclavian region, which had commenced without any unusual sensation; this he showed to the surgeon of the regiment, who pronounced it a simple glandular swelling; when examined again it was found to be an aneurism, and he was urged to go home in order that an opera-

tion might be performed. On the 25th of February he took the night train to New York; he felt very sick indeed, and was two or three times attacked with suffocation in the cars. He arrived in the morning of February 26th, and with assistance was able to walk up to the fifth floor of a tenement house.

CASE 45.—Strong-looking, florid man, enjoyed excellent health. In March, 1862, began to suffer aching pain in right shoulder-blade and arm, with numbness and tingling of those parts. About this time he also noticed a small tumour above the right clavicle, "with a beating in it," as he described it. The pain in the arm and the pulsation in the tumour were increased on any exertion.

CASE 53. *Forbes*.—A German farmer; whilst working in a hayfield with a pitchfork he felt something give way about his shoulder-joint, followed by pain and swelling.

CASE 63. *Key*.—A greengrocer's wife, and had been accustomed to use the right arm a great deal in weighing vegetables, coals, &c. This swelling was first observed three months ago, and she has complained of what she called rheumatic pains in the right arm, but her general health had been good.

CASE 70. *Brodie*.—A stableman, æt. 50. Accidentally discovered the aneurism whilst shaving. He had not met with any strain or other injury in the situation of the tumour, and had had light work and good health for the last eight or nine years.

CASE 71. *Auchinloss*.—In a weaver, æt. 65, a swelling made its appearance some eighteen months ago, and from that time gradually became larger; he was able to follow his employment as a weaver until three weeks ago, when he was obliged to give up from the uneasy feeling in the arm. He was not sensible of having received any injury, and had used no particular treatment.

CASE 74. *Blaker*.—The patient, a haybinder, æt. 59, says that two years ago, while at his employment, he felt a sudden pain in the right shoulder, but not sufficient to make him give up work; from that time it has continued more or less, and he considered it to be rheumatic. About nine months ago he first perceived the swelling, which has continued to increase.

CASE 75. *Paget*.—A soldier, who looked older than he was, æt. 54, accidentally discovered the aneurism ten days ago while washing himself; he had been subject to rheumatism about his right arm for three or four months.

CASE 78.—Travelled from the Highlands, 150 miles, and presented himself with a very large pulsating aneurismal tumour in the right axilla, which seemed to pass upwards underneath the clavicle. About nine months ago he had fallen on the ice with his arm stretched out, and to that accident he attributed the violent pains he experienced. These were at first supposed to be rheumatic, and it was only about ten weeks before setting off for Edinburgh that he was made aware of the nature of the tumour, which shortly before he had observed in his armpit.

CASE 83.—Jean L—, æt. 61; married at eighteen; widower for nine years. Has had ten children, only three lived, and in good health; the others died young, cause unknown. Has been a sawyer, wood-, and water-carrier. For ten years employed in former capacity, and used right arm in sawing. Never experienced any inconvenience in the shoulders. Has never served as a soldier. Has been in good health, and indulged in no excesses. His parents were long lived.

At twenty-two years of age he had three different attacks of a malady of the nerves, which involved different parts of the body, and disappeared spontaneously. In youth had chancre and discharge, which were cured without mercury in a very

short time. Never had hæmoptysis, but bleedings from the nose and prolapse of rectum, with piles. Never had any irregularity of the circulation. He cannot assign any cause for the disease.

For three years he has had a morbid sensation in his right shoulder when carrying weight on his yokes, but experienced pain only when doing so; never had any above the clavicle. Having uneasiness in outer and back part of arm, and this becoming worse, he applied to the hospital, having left off work for fifteen days. Questioned upon the development of the tumour, he said that it had been coming six months only, at least to his knowledge. He consulted a surgeon at Versailles, who ordered a blister to be applied over it, without any effect. Tingling and sensation of burning in the fingers. A month after the blister it commenced to be seen more distinctly, and progressively increased. It pulsed and augmented daily. The pains ceased when in bed. During last month the pains became severe, causing alarm and want of sleep. Has had no treatment for six months.

CASE 84. Gregg.—Formerly a soldier in the Queen of Spain's service, of dissipated habits. Since then employed as a labourer, and lately as porter in a tobacconist's shop. For three months complained of intense burning pain in right shoulder and arm, attributed to rheumatism, for which he was treated. The pain was aggravated at night, often depriving him of sleep. Has never carried any heavy loads, but been exposed to much vicissitudes of temperature. About two weeks ago he first observed a small tumour above the centre of the clavicle.

CASE 89. Colles.—A labourer, æt. 33; thinks he repeatedly hurt himself by endeavouring to push on with his shoulder a loaded car, the wheels of which had sunk deep in passing over heavy ground. Soon after these exertions, in the course of a week, the disease commenced.

CASE 92. O'Reilly.—Male, æt. 39, of robust frame, helper in a stable; has lived a life of confirmed intemperance, always drinking, but never incapable of attending to his duty. The first time he observed the tumour was two months ago, and since that time he thinks it has made but little progress.

CASE 95. Rodgers.—A labourer, æt. 42, about eight months ago suffered from pain and occasional swelling of the arm, but was not obliged to give up work; says that four weeks back, when carrying a basket of peaches on his left shoulder (about a bushel), he was suddenly seized with a severe pain in the shoulder and arm, and was obliged to lay down the basket, and on examining the part he then for the first time observed a swelling above the clavicle, about the size of a pullet's egg.

CASE 103. Hall.—A big, athletic labourer, æt. 52; no cause assigned. His back and shoulders were covered with eleven ulcerations, superficially irregular, of which some were more than two inches in diameter, and these had existed seven years.

CASE 109.—A tall, well-formed, muscular man, by trade a baker. He stated that about three years ago he first noticed a small lump in the right axilla, which increased gradually in size, and two months afterwards it became painful, the pain extending slowly down the front of the right arm as far as the elbow. At this time he was told that it was an enlarged gland, and therefore he did not think much of it, and was not inconvenienced by it beyond the pain.

CASE 114.—A man of good constitution, who had for a long time enjoyed good health, was attacked six months ago, after some violent exertion, with pain above the right shoulder. He discontinued his work, and on the third day perceived a pulsating tumour above the clavicle, about the size of one's thumb.

CASE 116. *Schm.*—A finance comptroller in an office, *set.* 39, strong and healthy, had experienced pain in the right arm ten months back, and about three months and a half ago, while washing, perceived a pulsating tumour above the clavicle, of the size of half an egg. This he ascribed to the effort of spitting blood, which he was troubled with just before.

CASE 118. *Butcher.*—The patient attributed a swelling in the right side of the neck to unusual exertion which he had made six months ago when white-washing some rooms, and remembers having experienced pains above the collar bone, particularly on one occasion, when straining to finish a part of the ceiling somewhat beyond his reach. For some days after the pains came at intervals when unusual demands were made upon that arm; and later still, so frequently, or sometimes without exertion at all, that he attributed them to rheumatism, more particularly as the annoyance was now as much referred to the front of the shoulder. Prior to this affection his health was excellent, for twenty years he had not known a day's sickness. He was temperate and regular in his habits. He was married at the age of thirty-five. From his occupation as servant to the higher classes he enjoyed all the comforts of life, and above all, had no mental disquietude, no excitation of the heart. Since these pains he has felt an indescribable apprehension and fear come over him when exercising the limb, so much so that after a time this monitor restricted guardedly every movement. He had a subdued expression of countenance, a subdued voice, a subdued movement, or rather every movement seemed controlled by apprehension and watchfulness; he was dispirited and dejected.

I offer no further remarks, as the accounts given in detail of the supposed origin of the disease in each case tell their own tale. If we read the cause, as stated by the patient, and look at the post-mortem account as detailed by the reporter, and compare cause and effect, we can pretty well arrive at a satisfactory conclusion. It would require much space to enter into a minute survey of each, so that it will be for my readers an interesting task to judge for themselves, and to make their own critical analysis from the materials put before them. They will often find the disease mistaken for rheumatism, and escaping notice for a length of time.

In 17 there was no assignable cause, or no cause mentioned, so there may be fairly presumed to have been a diseased condition of vessels throughout the progress. Among these—

There were 2 middle-aged females.

There were 15 males—2 at 39 *ys.*, 2 at 40, 1 at 42, 1 at 43, 1 at 50, 2 at 52, 1 at 54, 1 at 55, 1 at 59, 1 at 63, 1 at 65, and 1 at 69.

The remaining 13 cases were *due to violence*, and among these

1 was a female, æt. 46.

12 were males—2 at 33 yrs., 1 at 35, 1 at 40, 2 at 42, 1 at 43, 1 at 45, 1 at 50, 1 at 60, 1 at 61, 1 at 64.

On carefully perusing the history of these 13 traumatic cases, we cannot but come to the conclusion that the supposed or alleged injuries were only the exciting causes of the aneurism.

CLASS II, SECTION *b*, comprises the 14 cases in which the artery was dilated, with or without dilatation of the aorta, &c., implying an idiopathic rather than a traumatic source.

CLASS II.—Section *b*. Cases in which there was found Dilatation of the Artery, Aorta, &c.; Atheroma not specified.

No. and side.	Sex.	Age.	Occupation.	Cause.	Duration.
R. 1.	M.	43	—	— —	2 years, then became diffused.
L. 4.	M.	38	Pedlar, beggar	Carrying knapsack with straps round shoulder	8 months.
L. 9.	M.	55	Works at brass factory	No cause	2½ years.
R.&L. 13.	M.	60	—	— —	24 years.
R. 16.	M.	—	Huntsman	Sudden twist of head to right side	15 months.
R. 24.	M.	55	—	In habit of lifting heavy fish; tumour accidentally discovered (Mulatto)	7 months.
R.&L. 26.	M.	—	—	— —	—
R. 27.	M.	—	—	— —	—
L. 30.	M.	—	Soldier	— —	—
R. 55.	M.	43	Labourer	Spontaneous	14 months.
65.	—	—	—	— —	—
R. 91.	F.	57	Domestic	Spontaneous	2 months.
R. 115.	M.	59	Printer	No cause	3 months.
R.&L. 12a.	M.	52	Ropemaker	Spontaneous	4 years.

These are similarly tabulated, and consist of:—

5 spontaneous, æt. 52, 55, 43, 57, 59, therefore idiopathic.

3 called traumatic, ages 38, 53, and in one not stated.

But No. 4 was a fusiform aneurism occupying the whole course of the artery, and hardly to be called traumatic.

No. 16 could hardly have been due to sudden twist of the head.

No. 24 had an axillary aneurism and a popliteal aneurism as well.

Therefore these may all be referred back to spontaneous or idiopathic aneurism.

In the 6 cases which are not stated to be either spontaneous or traumatic the affection was, in all probability, due to general diseased action. In three of them there were aneurisms of both subclavians.

CLASS II.—Section c. Cases of subclavian Aneurisms in which the Arteries were examined after death, and stated to be healthy.

No. and side.	Sex.	Age.	Occupation.	Cause.	Duration.
R. 46.	M.	37	Formerly sailor; engine maker	Severe blow	6 months.
L. 59.	M.	36	Labourer	Severe jerk	7 days.
R. 93.	M.	38	Polisher of iron plates.	Great muscular exertion; rheumatism	5 months.
R. 96.	M.	50	Glazier	Attempt at reducing dislocation of humerus.	9 months.

CASE 46. Lawrence.—Has a healthy constitution, dark complexion, broad shoulders, and robust muscular frame. He was formerly a sailor, but has been employed for the last few years in engine making, well digging, and other laborious work. About six months ago, and soon after receiving a severe blow on the shoulder, he began to experience a dull aching pain, with partial numbness in the right arm and shoulder, which has continued up to the present time. The pain was occasionally so severe and constant that he was obliged to desist from work, and used to immerse the arm for several minutes in water from a cold spring, which always afforded temporary relief. Ten weeks ago the limb began to swell, and he consulted some one, who directed him to soak it in hot water, and to rub it with a liniment. He has noticed during the last month or six weeks a swelling and heating about the right shoulder. Ten days before admission, when the arm was much swollen, and insufferably painful, he was bled to the amount of three pounds without fainting, and afterwards performed a hard day's work. Eight leeches were applied on the same evening. From these measures he obtained great relief, with diminution of the swelling. During the last week he has been rendered incapable of attending to his business, in consequence of continual pain and stiffness of the arm.

CASE 59. *Hilton*.—Followed severe jerk of arm. The original aneurism had been formed by dilatation of about two inches of lower part of the subclavian joining the axillary. Heart, aorta, and other arteries healthy.

CASE 93. *Partridge*.—Intemperate; a grinder and polisher of heavy iron plates, requiring great muscular exertion of the arms. Had been the subject of several slight rheumatic attacks, and about a year back was laid up with what he called fever for six weeks; after this he was always subject to pains below the clavicle; these pains increasing, he was obliged to give up work.

CASE 96. *Awverf*.—A glazier, æt. 50, nine months back had a dislocation of the shoulder, which remained for several days, when it was reduced with slight traction; suffered afterwards much pain, so that fresh attempts were made to reduce it, as it was supposed to be not quite replaced. Symptoms became much worse, and tumour formed.

CLASS III.—Cases in which a post-mortem was made, but there is no reference to arterial disease, or to the state of the heart and arteries.

No. and side.	Sex.	Age.	Occupation.	Cause.	Duration.
L. 5.	M.	46	Labourer	—	— Diffused.
R. 12.	M.	—	Huntsman	Inordinate use of arm	— Fusiform, diffused.
L. 40.	M.	40	Coachman	No cause	3 months, circumscribed.
R. 44.	F.	69	—	Supposed reduction of dislocation	2 " diffused.
R. 56.	M.	40	—	Spontaneous	2 years, circumscribed.
L. 61.	M.	40	—	—	6 months, large femoral aneurism.
R. 68.	M.	48	Clergyman	Fall from horse, latter rolling over him	6 months, fusiform.
R. 69.	M.	73	Countryman	Spontaneous	3 months, circumscribed.
L. 73.	M.	50	Bargeman	Heavy rowing	6 " "
R. 94.	M.	32	Clerk at wharf, left-handed	Spontaneous	7 weeks "
R. 97.	M.	—	Sub-officer	Ditto	— Large.
R. 98.	M.	21	—	External injury	10 weeks, diffused.
R. 99.	M.	57	Sailor	Muscular exertion and fall on shoulder	3 months, became ditto.
R. 102.	M.	36	Countryman	Blow on shoulder	1 year, circumscribed.
R. 104.	M.	31	—	Spontaneous	2 years "
R. 105.	M.	30	Carter.	Fell on shoulder and fractured clavicle	4 months "
R. 110.	M.	46	—	Squeeze of shoulder	Several years "
R. 112.	M.	31	Tailor	Fall	6 months "
R. 113.	M.	—	—	No cause	7 " "

The following are the details of the foregoing cases :

CASE 5. Burton.—Labouring man. Three years previously he had been attacked with hæmoptysis, and spat up about three pints of frothy blood. Ever since he has been subject to dyspnoea, but went on with his work until one year before admission. At that period he caught cold, and his dyspnoea became more urgent, and he had great pain in his elbow of the right arm. He also became subject to giddiness, and swelling and numbness of the right arm and hand.

CASE 12. Porter.—Specimen, mentioned in 'Houston's Catalogue,' of a subclavian aneurism taken from the body of a huntsman, and supposed to have been produced by inordinate exercise of the right arm.

CASE 40. Oppolzer.—A coachman, æt. 40, always enjoyed good health; when at age of twenty had intermittent fever, and was cured in three weeks. About three months ago he had first felt pain in the left arm, which had increased within a month, so that he was forced to leave his employment. He only discovered the swelling about two months back, and it was then the size of a walnut; and on account of the pain in his arm he got bled, but becoming worse he came to the hospital.

CASE 44. Dupuytren.—*Aneurism of the subclavian artery, mistaken for an abscess.*—"Marie Charlotte M—, æt. 69, came from the country into the Hôtel Dieu, in April, 1810, suffering from two gangrenous sloughs on the inside of the elbow; and these were accompanied by œdema and loss of power of the limb. A fortnight after admission, the patient was going on well, when she complained of a little swelling, about the size of an almond, in the axilla of the affected side. The dresser took this for a swollen gland; and though he could not detect the pulse at the wrist, he attributed this to the œdema, or to ossification or contraction of the artery. Six days later, as she suffered more, I examined her myself. On feeling the tumour, fluctuation was distinct, but no pulsation could be detected. I believed it to be an abscess; and I founded this opinion on the history of the case, the existence of ulcers at the elbow, the marked decrease of suppuration, the rapid development of the tumour, and finally the complete absence of pulsation. (To have removed all doubt, the artery should have been compressed above the tumour.)

"The opening of the supposed abscess was deferred until the following day, when the patient was further questioned respecting the history of her complaint, &c., and her answers appearing satisfactory, I took a long, narrow, and sharp-pointed bistoury, and passed it slowly and cautiously into the most prominent part of the tumour, where fluctuation was most apparent. On withdrawing the instrument, it was followed by a jet of arterial blood. I at once closed the opening with my finger, and felt the pulse of the diseased limb. The artery seemed full but without pulsation. I was, for a moment, disposed to ascribe this jet of blood to the section of a superficial branch greatly enlarged by inflammation. The removal of my finger from the orifice, however, speedily satisfied me that I had indeed opened an aneurism; and now, for the first time, I detected a slight quivering sensation in the tumour, like that of a body in vibration.

"She was again questioned, and from her answers, which were now true, we learned that four months previously she had had a fall by which her shoulder was injured. Neither fracture nor dislocation could be detected by a surgeon to whom she applied; but being dissatisfied, she consulted a bone-setter, who said her shoulder was out, and used immoderate violence in pretending to set it to rights. The con-

dition of the arm for which she was admitted was the consequence of this violence; but she dated the origin of the axillary swelling to a fall on the elbow which she had some days subsequent to her admission into the hospital. The wound was closed with plaister, compress, and bandage."

CASE 56. *Fergusson*.—Male, æt. 40, of average weight and bulk. The patient had noticed a swelling at the bottom of the right side of the neck for about two years, but only recently had he taken advice about it.

CASE 61. *Sir A. Cooper*.—No previous history.

CASE 68. *Colles*.—Clergyman, æt. 48, athletic frame, most robust health, and lived a regular, temperate life. About six months ago, one night before Christmas, while lying in bed, his right arm was suddenly seized with a numbness in the right hand, which felt as if instantaneously enlarged to twice its natural size. He recollected afterwards that a few days before his horse had fallen and rolled over him, and that he suffered considerable pain about the shoulder at the time of the fall.

CASE 69. *Travers*.—A countryman, æt. 73, first perceived a swelling on the right breast about three months ago, and it has since been gradually increasing.

CASE 73. *B. B. Cooper*.—A navigator of barges; intemperate. Six weeks since, after some heavy rowing, he perceived a dull aching pain, accompanied with an ill-defined swelling about his left shoulder, which, from its coming on gradually, he supposed to be the consequence of an attack of rheumatism.

CASE 94. *Liston*.—A clerk in a wharf office; he is left-handed. He assigns no cause, and only perceived the tumour four days before admission. Five or six years ago had a bubo in the groin, for which he rubbed in mercurial ointment, and was salivated.

CASE 97. *Arendt*.—No history.

CASE 98. *Bayer*.—A strong, healthy man, æt. 21; had suffered much from a right subclavian aneurism, following a previous external injury.

CASE 99. *Mott*.—A sailor, æt. 57, admitted as a medical patient for a catarrhal affection and rheumatism of shoulder, which was swollen, but subsided under blisters; but a tumour remained, which was hard and unyielding, with an obscure pulsation, which was supposed to be communicated to it by the subclavian artery; this suddenly gave way, and evidence of aneurism existed. He stated that about a week before admission, whilst at work on board a ship as seaman, he slipped and fell on his right shoulder and back of the head. The sac did not give way until two months after admission.

CASE 102. *Arendt*.—A strong countryman, æt. 36, was always healthy, until a year ago, when he received a severe blow on the shoulder, followed by pain and swelling; but under the application of cold, these symptoms soon subsided.

CASE 104. *Bland*.—Male, æt. 31. Two years ago he perceived a small, throbbing tumour immediately over about the middle of right clavicle; and six months after suffered from pain, &c. His general health had been good. No further history.

CASE 105. *Lizars*.—A carter, æt. 30; fifteen months ago he fell from his cart, pitching on the right elbow; and had, for some days afterwards, numbness of the ring and little fingers. Four months ago (*i. e.* eleven months after first fall) he met with a similar accident, by which his left clavicle was fractured, but it united without any unusual symptoms occurring. About five or six weeks ago his attention was particularly drawn to his right arm and forearm by occasional pains resembling

cramps, which he ascribed to rheumatism. He never observed any tumour until pointed out to him by the surgeon.

CASE 110. *Pirogoff*.—A strong-built, middle-aged man, attributed the tumour, of size of pigeon's egg, to a squeeze of the shoulder several years previously. About twelve years before he suffered from abscess and inflammation in the clavicular region. The aneurism lay in the place of the old abscess. He suffered also from chronic cough.

CASE 112. *Liston*.—A tailor, æt. 31; six months ago he fell down with his right arm behind him, and sprained it a good deal; and about six weeks afterwards he first perceived a small tumour.

Of the foregoing cases, in two, where the cause is not stated, viz. Nos. 5 and 61, it is more than probable that the aneurisms were idiopathic or spontaneous; in ten the disease is represented as traumatic, but there is no doubt that in four of these the primary cause was disease of the coats of the vessel; in cases 12, 68, 73, 79, and in six others the aneurisms may be referred directly to injury; in No. 44 there were two sacs, and in the others there is still considerable doubt as to the primary traumatic origin.

CLASS IV.—*Cases of subclavian aneurism, in which death took place, but no post-mortem was made.*

No. and side.	Sex.	Age.	Occupation.	Cause.	Duration.
L. 14.	M.	47	—	Forcible struggling	8 years.
R. 15.	M.	—	—	Struck shoulder while walking	1 year.
R. 22.	M.	65	Repairs roads	Exertion	Many weeks, became diffused.
— 54.	—	—	—	—	—
— 66.	—	—	Private case	Rheumatism	— Circumscribed.
— 67.	M.	42	—	—	—
— 81.	—	—	—	—	—
R. 90.	F.	21	Domestic, married	Thrown from gig upon shoulder	2 years, circumscribed.
R. 100.	M.	—	—	—	— Dilatation.
R. 101.	M.	—	—	—	— Ditto.
R. 106.	M.	—	—	—	—
R. 107.	M.	—	—	—	Large aneurism by dilatation.
R. 108.	M.	—	—	—	— Large.
R. 117.	M.	32	Negro, store-keeper	Muscular exertion	3 months, circumscribed.

CASE 14. *Guattani*.—A man, æt. 47, was seized by robbers in a wood and deprived of his clothes, and bound to a tree; after five hours' varied efforts to break

through the cords, he was found by a chasseur, and set at liberty; from this time his health languished, and eight years after he entered the hospital, having a tumour of the size of a pigeon's egg above clavicle.

CASE 15. *Van Swieten*.—"I have seen a case where an aneurism had arisen from a contusion; a man of small stature was walking at dusk, when he struck his right chest most violently; acute pain followed, which soon ceased. After some months he began to have pulsation under the clavicle, which increased; he lingered for a year and died suddenly."

CASE 22. *Wardell*.—A fresh-looking man, æt. 65, ruddy; the volume of flesh good, appetite not impaired. He regularly pursued his occupation, that of a repairer of roads. He had enjoyed good health until now, when he suffered from an acute rheumatic pain in the right shoulder. This pain he had experienced many weeks, and he had been bled and blistered without benefit. The right hand became slightly swollen, and there was a sensation of numbness in it, and he thought it not so strong as the other. He stated that near to the collar-bone was a small lump which fluttered and beat.

CASE 54. *Mott*.—Mere allusion to aneurism.

CASE 66. *Lawrence*.—Ditto.

CASE 67. *St. Thomas's Hospital*.—Operation merely recorded.

CASE 81. *Gore*.—No account whatever.

CASE 90. *Mott*.—F., æt. 21, states that a year or two before she had been thrown from a gig, and received a violent contusion of the right shoulder and left side of the body, from which she had gradually recovered, with the exception of a deep-seated fixed pain in the injured shoulder, and the subsequent appearance of a small throbbing tumour above the collar-bone.

CASE 100. *Graefe*.—No account.

CASE 101. *Norman*.—Ditto.

CASE 106. *Dupuytren*.—Ditto. Merely referred to as occurring to a surgeon.

CASES 107, 108. *Cooper, of San Francisco*.—No detail.

CASE 117. *Canton*.—A negro, æt. 32, storekeeper from Barbadoes; three months ago, after driving a large nail with a very heavy hammer, became affected with a small tumour.

Among these 14 cases—

We can hardly call the disease actually traumatic in Nos. 14 and 22, it being really idiopathic, although the rupture of coats followed an injury.

This collection stands, then, thus corrected:—

Three spontaneous, Cases 14, 22, 66.

Three traumatic, Cases 15, 90, and 117; but Case 15 was one of aneurism by dilatation.

Eight cannot be traced in any way to their causes, as no details whatever are given.

CLASS V.—31 Cases of Subclavian Aneurism, in which recovery took place.

Side and No.	Sex.	Age.	Occupation.	Cause.	Duration and character.
R. 2.	F.	60	—	—	5 weeks, circumscribed.
R. 3.	—	—	—	—	—
L. 11.	M.	—	—	—	—
R. 37.	M.	—	Carter	—	—
R. 37a.	M.	—	—	—	—
L. 38.	M.	37	Ropemaker	Stretching ropes	3 weeks, circumscribed.
R. 39.	M.	50	Retired officer	Epileptic; violent strain	1 year " "
L. 41.	M.	45	Fishmonger	Syphilis	" "
L. 42.	M.	—	Player on harp	Ditto	" "
R. 43.	M.	39	—	Lifting weight	6 months, became defused.
R. 47.	M.	42	—	—	6 months, large, circumscribed.
R. 48.	M.	45	—	Rheumatism	8 months, circumscribed.
R. 49.	M.	46	Shipwright	No cause	2 years " "
L. 50.	M.	39	Ship's cook	Strain	14 months " "
R. 51.	M.	41	Steam machinery	Changes of temperature	13 " "
R. 52.	M.	44	Labourer	No cause	Not aware of its existence.
R. 57.	M.	44	Sailor	Spontaneous	9 months, circumscribed.
R. 58.	M.	53	—	Carrying weight with rope round neck (Albino)	8 " "
L. 60.	F.	65	—	—	Long time circumscribed.
R. 62.	M.	47	Labourer	Spontaneous	2½ years " "
L. 72.	M.	—	Clergyman	Ditto	2 months " "
L. 76.	F.	21	—	Muscular exertion during a fall	— " "
R. 77.	M.	35	Workman	Heavy hammering	— " "
L. 79.	F.	30	—	Drawing cork of bottle	4 months " "
R. 80.	M.	60	Sailor	Barrel fell on shoulders	Some months " "
L. 82.	M.	30	Cooper	Carrying weights with rope round neck; syphilis	4½ " "
L. 86.	M.	47	Porter	Rheumatism	6 weeks " "
L. 87.	M.	40	Ostler	Spontaneous	Not aware of existence.
R. 88.	M.	38	Merchant	Ditto	4 months, circumscribed.
R. 111.	M.	32	Ship's steward	Muscular exertion (Mulatto)	3 " "
R. 119.	M.	33	Ship's engineer	Ditto	2 years, fusiform.

CASE 2. *Hodgson*.—No detail.

CASE 3. *Orpen*.—Ditto.

CASE 11. *Porter*.—Ditto.

CASE 37. *Guérin père*, 1790.—No assignable cause.

CASE 37a. *Guérin fils*, 1812.—No assignable cause.

CASE 38. *Yeatman*.—M., æt. 37, living near Bristol, robust, healthy from childhood, of a calm and firm mind. He had been employed in ropemaking for twenty-five years. About three months ago he perceived a tumour about the size of a large nutmeg above the left clavicle, but did not think it of consequence to him. He was at this time employed in manufacturing and stretching some of the larger kind of rope. Had a hard cough, and also a dull pain in the arm, which he attributed to rheumatism. Six months elapsed when he discovered a pulsatory motion in the tumour; says it was evidently enlarged, and felt at this period a tingling sensation in the fingers, with a dull pain and numbness in the middle and outer part of the forearm, an inch below the origin of the brachialis internus muscle, occasionally suspended by friction.

CASE 39. *Cloquet and Bernardin*.—M., æt. 50, a retired officer in the army, whilst attempting to lift a heavy piece of furniture about twelve months since, perceived a swelling to appear very suddenly just above the right clavicle, which in a short time became of the size of a large egg; it was not painful; the skin surrounding it became very much discoloured, and the pulsations in the tumour, which were very strong, were synchronous with those of the heart. The patient applied of his own accord twelve leeches to the part, which produced no good effect; but not feeling at all alarmed at what had happened, he paid little attention to the complaint until April, 1823, at which time he felt acute pains in his right shoulder. These pains increased until the month of July, and were attended with a feeling of formation, and a sensation of coldness from the shoulder down the arm, the forearm, and hand; and they were, at different times, so severe as to cause the patient to faint. He then consulted a physician, who advised him to use the vapour bath; he used the vapour bath about sixty times without benefit, for he still felt the sensation of coldness in the affected limb, the motion of which became more and more difficult. A well-informed surgeon saw him about this time, and informed him of the nature of his complaint, and advised him to submit to an operation, to which he would not consent. Some time after he was seized with an inflammation of the intestines, which was treated by soothing measures, and a spare diet: and during the progress of this latter affection the arm became almost immovable; the pain in it was severe, following the track of the nerves. He was obliged to wear his arm in a sling, and the power of moving the arm with the feeling of coldness increased as the pains diminished.

CASES 41, 42. *Lancisi*.—Both attributed to syphilis.

CASE 43. *Pencoast*.—Six months previously the patient observed a swelling at the root of his neck, just above the clavicle, upon the right side, which he attributed to lifting heavy weights; pain in the arm and shoulder soon came on.

CASE 47. *Lloyd, St. Barthol.*—No account.

CASE 48. *Langenbeck*.—A tolerably strong-made man, the father of many healthy children, eight months ago commenced to have pain in the right arm, which extended from the shoulder, and from the side of the neck down the arm, and was treated for rheumatism by sulphur baths, but without benefit. The pain continued and prevented sleep, and the arm became weaker. Some few months afterwards he accidentally discovered, by a looking-glass, that there was a swelling on the right side of the neck, pulsating distinctly.

CASE 49. *Cornier*.—Shipwright, æt. 38, had been previously the subject of pop-

lital aneurism in both legs, and underwent successful treatment by pressure on femorals in the years 1859 and 1861. In June, 1866, he noticed a pulsating swelling above the right clavicle, the size of a walnut, but could assign no cause for it.

CASE 50. *Warren, J. M.*—A coloured man, æt. 39. "Sent to me with a large tumour of left subclavian, March 2nd, 1854. I found him lying under the staircase in an apparently dying state. The patient stated that he had left Gloucester in a vessel about one week before, had been kept out by stress of weather, and, finally, had been landed in a different parish, from which he had walked to Boston. He was suffering much from excessive pain in the arm, which was enormously swollen. He had an asthmatic cough and great dyspnoea. He was immediately sent to the hospital, placed in a warm bath and thence to bed.

"He had been a hard-working man, strained himself fourteen months ago, and had at the time uneasy sensations about the shoulder. He first noticed the tumour above the clavicle in July, 1853, worked until February 22nd, 1854, when the pain in the arm and tumour obliged him to desist."

CASE 51. *Warren, J. M.*—A mechanic from Scotland, æt. 41. The tumour when first noticed, eighteen months previously, was situated about the middle of the clavicle. Being a strong active man in good health, he paid no notice to it. He had been employed twenty-seven years in the manufacture of steam engines, and exposed much to changes of temperature.

CASE 52. *Poland.*—Æt. 44, a bricklayer's labourer, but for several years previously had been employed at the gas works, and had done much heavy work. Latterly he had been in the habit of carrying a hod of bricks over the right shoulder until he could do so no longer. With the exception of an attack of rheumatism ten years ago, chiefly affecting the left shoulder, he had always enjoyed good health. For the last two years he had suffered from occasional pain in the right arm, which had been gradually becoming weaker. He attributed this to an injury received two years since in the right index finger, which became inflamed but healed in three weeks. During the last month this pain had become more severe and continual. It was of a growing character and was chiefly in the forearm, but occasionally extended upwards to the shoulder, especially at night. Three weeks ago he was compelled by the pain to give up work, and had medical advice, and was treated for rheumatism. The pain continuing unabated the man applied to Dr. David Johnson of the Old Kent Road, who immediately discovered a pulsating tumour above the clavicle, of the presence of which the man was quite unaware, and to which he was not at all disposed to attribute his sufferings.

CASE 57. *Fergusson.*—M., æt. 44. About nine months ago he first perceived an occasional weakness in the right forearm, especially after using it. This gradually increased and was accompanied by a dull gnawing pain at the inner and back part of the forearm, attended with a tingling sensation at the tips of his fingers. About five months ago he perceived that he had no pulse at the wrist. He became aware of the presence of an aneurismal tumour only a few days ago.

CASE 58. *Little.*—Male, æt. 53. Habit of carrying a basket of eggs and fish on his back suspended by means of straw ropes, through which he passed his arms. First felt pain in the right arm in the preceding month of March, which gradually became so severe in the month of May that he was frequently obliged to sit down by the road side and remove his burden for a time. Soon afterwards he discovered

a tumour above the right clavicle on which one of the ropes pressed. It became painful after a short time, and in the beginning of July he perceived a beating in the lump, which then began to enlarge rapidly. In the month of August he says he had such a feeling of drowsiness that for a fortnight he slept the greater part of each day and night, during which time he lost his appetite and took nothing but milk, and at this time he was unable to feel his fingers. Sleep then suddenly deserted him, and he declares that for a fortnight before his admission he did not sleep for a single hour owing to the intensity of the pain in the tumour and along his arm.

CASE 60. *Abeille*.—No account whatever.

CASE 62. *Porter, Lectures*.—He had been a labourer, but not employed in any particularly hard work, nor is he sensible of having ever received any injury. About two and a half years ago, he perceived a small kernel-like tumour above the middle of the clavicle, which was not painful, and increased but very slowly. It gave no uneasiness at first, and the patient stated that it was only within the last twelve months that he experienced numbness or pain in the arm.

CASE 72. *Skay*.—Clergyman. Was suffering for two months from numbness in hand, and observed it to be more susceptible of cold, and that it required the application of artificial warmth to enable him to use it while dressing.

CASE 76. *Nicholls*.—Æt. 21. A pulsating tumour in the neck made its appearance immediately after the patient had subjected her left arm to severe and unusual exertion in saving herself from a fall.

CASE 77. *Green*.—Stated to be from exertion in heavy hammering.

CASE 79. *Warren, J. M.*—"A lady, æt. 30, of delicate constitution, had had a congenital club-foot of the worst kind, and a double curvature of the spine. For the former of these she was treated when young, and after section of the tendons, followed by appropriate treatment, the foot was completely brought to its natural position, so that she was enabled to walk with ease without the aid of mechanical support. The curvature of the spine was submitted to a similar treatment, with the same successful result. She consulted me in the early part of December, 1847, for an aneurismal tumour just above the scapular end of the clavicle, about the size of a pigeon's egg, of which she gave the following history:—Four months before, while in attendance on a sick brother, she had occasion to draw the cork from a bottle, and felt a sudden crack over the clavicle. Her attention was not attracted to it at the moment: but a short time afterwards a small swelling having a decided pulsation was distinguished at the spot, and rapidly increased in size."

CASE 80. *Bullen*.—Sailor, æt. 60. About four months ago a tar-barrel fell upon his shoulder, but occasioned him only temporary inconvenience.

CASE 82. *Sawinkoff*.—A cooper in the marine division at St. Petersburg, carrying weight on June 24th. Had a tumour under left clavicle, which was stated to be caused by the pressure of the rope which hung around the neck over the left shoulder, supporting four barrels in front and five barrels behind, causing him such severe pain that he fainted. On recovery he felt weak, but returned to his ordinary work. Three weeks after, he felt pain under left clavicle, and at the painful spot he felt a pulsation which daily increased, and in a short time an external tumour made its appearance.

CASE 86. *Wishart*.—States that six weeks ago he was attacked with pain in the elbow-joint, which increased notwithstanding bleeding, blisters, &c. On admission he referred all his ailments to the elbow, fleshy part of the biceps and forearm

which latter was oedematous. There was also considerable oedematous swelling of his side, extending down to the ilium. On examining the chest, the aneurism was for the first time discovered. On questioning the patient, he stated that about three weeks before admission he had noticed a small knot like a bean under the edge of the clavicle, but he could not point out the precise spot, and paid no attention to it, as it gave him no uneasiness.

CASE 87. *Porter*.—Had no recollection of having ever sustained any injury in that part, neither had the tumour been observed by him until eight or nine days since. Even after examination he could not be persuaded that the tumour, in which he felt no pain, could be the cause of, or connected with, the uneasiness and numbness of the arm.

CASE 88. *Hobart*.—"A respectable inhabitant of Cork, of good bodily habits, consulted me for a tumour situated immediately under the right clavicle. Upon inquiring into his history, I learnt that about four months previously, while in the enjoyment of his usual health, and uninfluenced by any bodily exertion, he suddenly felt an unusual sensation, as if his heart had leaped from its proper position to that now occupied by the tumour. This, however, went off in a little time, and he paid no attention to it afterwards, while the appearance of the tumour and its increasing inconvenience had somewhat alarmed him."

CASE 111. *Dr. Smyth*.—A mulatto ship's steward, æt. 32. Dates the commencement of his ailment from a collision which befel his ship three months back. In his efforts to save himself, he tried to board the other ship, and, holding by the anchor, he sustained for a time his own weight and that of another man, who clung to him in a similar attempt. He felt pain in the shoulder from that time, and in about a month he noticed a small throbbing tumour.

CASE 119. *Spence*.—An engineer on board a steam-vessel, æt. 33. Had been long on foreign stations. Attributed the disease to exertions in repairing machinery, but the history was not very distinct. The aneurism was fusiform and occupied the whole extent of the artery.

Thus of the above 31 recoveries we may fairly presume—

That in 15 the cause was spontaneous, and probably from atheroma, and called into action by undue exertion—Nos. 38, 41, 42, 48, 49, 50, 51, 52, 57, 62, 72, 86, 87, 88, 119.

That in 9 the cause may be set down as traumatic—Nos. 39, 43, 58, 76, 77, 79, 80, 82, 111.

In 7 no account is given—Nos. 2, 3, 11, 37, 37a, 47, 60.

Resumé of Causes.

A.—PROOF DIRECT.				B.—ASSUMED OR CONJECTURAL.				
Assignable cause.	Atheroma.	Dilatation.	Healthy.	P.M., but vessel not examined.	No p.m.	Recovery.	Uncertain.	Total.
Spontaneous ...	17	5	—	7	3	15	—	47
Traumatic	13	3	4	10	3	9	1	43
Nose stated ...	—	6	—	2	8	7	1	24
Specimens	3	—	—	—	—	—	4	7
Total	33	14	4	19	14	31	6	121

Thus in 33 there were distinct proofs of atheroma.

14 the artery or aorta was dilated, and the disease cannot be called traumatic.

25 the aneurism was acknowledged to be spontaneous; no evidence to the contrary.

—
72 cases, all fairly to be set down to idiopathic causes.

8. THE SITUATION OF THE ANEURISM, whether in the 1st, 2nd, or 3rd portion of the vessel.

This analysis is, for the most part, only conjectural, especially so far as the third portion is concerned, and as regards cases in which no post-mortem enabled the true place of origin of the aneurism to be accurately observed.

I have given such details as are offered, referring to the numbers in the tables, and prefixing an asterisk to those cases in which the *left* artery was the one affected.

- a. *Aneurism occupying the whole course of the artery from origin to axilla, and therefore with more or less dilatation of the whole of the coats, forming, generally, aneurism by dilatation, 13 cases—Nos. 1, 7, 8, 21, 27, 45, 48, 55, 82, 118, 114, 115, 119.*
- b. *Aneurism of the first portion, 9 cases—Nos. 6, 19, 23, 35, 26 (in this there was also aneurism of left artery), *4, *30, *33, *29.*
- c. *Aneurism of first portion and innominate, 3 cases—Nos. 17, 63, 64.*
- d. *Aneurism of first portion and carotid, 1 case—No. 107 (query 37 and 37a).*
- e. *Aneurism of second and third portions of subclavian, 9 cases—Nos. *38, *95, 97, 104, 112, 113, 116, 117, 12a in Appendix.*
- f. *Aneurism of second and third portions of the subclavian and of axillary, 1 case—No. 109.*

*g. Aneurism of third portion of the subclavian, 25 cases—Nos. 9, *11, *14, 22, 24, 25, 31, 37, *40, *41, *42, 49, *50, 51, 52, 53, 56, 57, 58, 60, 62, 90, 96, 105, 111.*

*h. Aneurism of third portion of the subclavian and of axillary, 26 cases—Nos. *5, 39, 40, 43, 44, 47, 66, 67, 68, *71, *72, *73, *76, *79, 80, 81, *83, *87, 91, 93, 94, 98, 99, 102, 103, 110.*

*i. Aneurism of axillary artery and of confines of subclavian at first rib, 11 cases—Nos. 2, 10, 12, 13, 18, 46, *59, *61, 84, 86, 88.*

9. *The size and progress of the Aneurism*, its form and volume.—Subclavian aneurisms may be globular or ovoidal; some have a singularly compressed appearance, and others are remarkably lobulated, especially when very capacious and extending deeply among the surrounding structures, which then indent their surface. They are seldom very large, unless when diffused, in which case they may attain an enormous magnitude. They are generally only noticed when they have reached a certain size, most commonly that of an egg.

Originally small, deep seated, circumscribed and indolent, they steadily augment in volume, approaching nearer and nearer to the surface; they then lose their defined shape, become the seat of incessant pain, and at length contract adhesions to the surrounding parts, identifying themselves, as it were, with these. The adhesion of the sac to the subclavian vein, as also to the upper part of the apex of the lung, cupped to receive it, is by no means unfrequent, and must be borne in mind by the surgeon.

In endeavouring to elucidate these points, I have entered into a detailed account of each case in reference to this matter, as furnished by the report; and have re-arranged them, in as succinct a form as possible, in two classes.

I. Those of definite size—circumscribed aneurism.

II. Those of the diffused form of aneurism.

I. Those cases in which the aneurism is circumscribed, varying in size from that of a bean to that of an orange. In all probability some of these were simply dilated arteries.

FORM.

Compared to size of fruit—

Small bean, No. 33.	Half an orange, 59, 66, 103.
Spanish nut, 19—became diffused.	Orange, 74, 75; one belongs to dilatation, 28.
Large filbert, 52.	Small lemon, 70—belongs to fusiform dilatation.
Chestnut, 4, 30.	Small apple, 115, 45; this last belongs to dilatation.
Walnut, 40—became diffused.	Half an apple, 118.
Large walnut, 96.	
Small orange, 57, 111; two became diffused, 22 and 56.	

Compared to eggs—

Pigeon, 14, 79, 104, 110; 9, 48, 63, belong to dilatation, and 50 to diffused aneurism.	egg in size; 21, 23, 37, 53, became diffused; 49, 114, were dilatations.
Pullet, 38; 2 and 10 became diffused.	Duck, 55.
Hen's, small, 95, 105.	Goose 32, 58, 68, 102.
Hen's, 24, 37, 60, 76, 82, 94, 112, 118; 72, 86, 87, 115, were half hen's	Swan, 69.
	Turkey, 73.

Miscellaneous—

Foot-ball, 78, became diffused.	Large, 17, 19, 84, 85, 107, 108, 117.
Child's head, 47.	Forty-eight pound shot, 18, became diffused.
Size of fist, 35.	
Small, indefinite, 20, 26, 30, 109.	

SHAPE—

Pyriiform, 71,—dilatation.	Fusiform, 12, 70, 119,—dilatation.
Conical, 80, 89,—dilatation.	Cylindrical, 13,—dilatation.

Not stated—Nos. 11, 34, 41, 42, 54, 67, 101, 106.

Further detailed account of the circumscribed aneurisms, as regards size and progress.

CASE 38. *Yeatman*.—Size of nutmeg, increased to pullet's egg in three months. February, 1813, placed under Valsalva treatment, and remained stationary for six months, when began slowly to enlarge, and in three months more was about the size of a half-pint breakfast cup, and had risen one inch above the anterior surface of the clavicle, and had displaced that bone somewhat out of its natural situation. It increased somewhat for another two months, when it became stationary, and remained so for three months, when pulsation was not so strong, and tumour more tense. In

June, 1814, over a year and a half after first recovery, the tumour began to get less being remarkably tense; pulsation scarcely perceptible, and gradual and slow diminution.

CASE 58. *Little*.—Size of goose's egg; skin red and inflamed, and threatening rupture.

CASE 60. *Abeille*.—Tumour remained for a long time without growing, but latterly acquired a sensible development, soon reaching the size of a hen's egg.

CASE 66. *Lawrence*.—Tumour apparently not larger than half an orange, situated in the axilla, and having a small, pouch-like extension over the situation where it was attempted to tie the subclavian; it was found to have extended into the chest partially absorbing the first and second ribs.

CASE 73. *B. B. Cooper*.—"The clavicle is much altered in position, being thrust forward at the sterno-clavicular articulation, and much raised at its acromial end, so that when the man is standing upright, it forms less than half a right angle with the sterno-mastoid muscle; the neck is on that side consequently much shortened, and the depth of the ribs increased. The tumour, which has thus displaced the clavicle protrudes forwards below, and as far as is visible, is about the size of a turkey's egg; but it also rises up into the neck considerably."

CASE 78. *Liston*.—A large axillary aneurism of the size of a common foot-ball, and which seemed to pass upwards underneath the clavicle, which was considerably raised; it extended downwards below the border of the axilla, pressing in the ribs and flattening the chest.

CASE 82. *Sawinkoff*.—Tumour size of hen's egg, under acromial end of clavicle, lying to the inner side of the head of the humerus under the pectoralis minor. On feeling the subclavian as it passed over the first rib from outside the scalenus, an aneurismal thrill was felt, as also a trembling movement of the walls of the vessel; the same condition was found in the aneurism itself. The arteries of the neck could be seen strongly pulsating. In the course of a month the swelling rose above the clavicle, and had reached the size of a goose's egg. Veins over the tumour enlarged."

CASE 84. *Gregg*.—Tumour extended from under the sternal two-thirds of the clavicle (which was elevated about one inch) down into the axilla, the anterior half of which it nearly occupied. On pressing hand over tumour the *frémissement cataire* was very perceptibly felt, and on auscultation a *bruit de souffle* was distinctly audible. The anterior portion of the right subclavian region was perfectly clear on auscultation and percussion. Slight bruit in the cardiac region, but this appeared to be a reflex sound from the aneurismal sac, otherwise the heart's action seemed normal.

CASE 85. *Seutin*.—The tumour commenced at the junction of the inner third with the middle third of the clavicle, was directed towards the axilla, and raised the upper part of the pectoral region. Its form was ovoid, and its great diameter was transverse; its size at least that of a hen's egg. The skin over it was neither hot nor red, and the pulsation in it synchronous with the pulse; and on auscultation a well-marked *frémissement* was heard. Pulsations felt in the supra-sternal fossa. He had dyspnoea and cephalalgia, and occasional attacks of asthma.

CASE 86. *Wishart*.—A considerable swelling was found under the pectoral muscles, extending along the lower margin of the clavicle to the axilla. It pulsated, and had a peculiar thrill, more especially at the sternal end of the tumour.

CASE 87. *Porter*.—Firm, pulsating tumour below the clavicle, in that part corresponding to the division between the pectoralis major and deltoid muscles; was about the size of the half of a hen's egg. The tumour rapidly increased, extending outwards towards the axilla, and displacing the clavicle upwards. It increased to more than double its original size in a few days.

CASE 88. *Hobart*.—The tumour was seated immediately under the right clavicle, near to its acromial end, and extended towards the axilla; it was somewhat larger than a hen's egg.

CASE 102. *Arendt*.—About six weeks ago a swelling appeared about shoulder which increased to the size of a goose's egg, and lay behind the clavicle, extending from the sterno-mastoid muscle.

CASE 104. *Bland*.—Two years ago perceived a small, throbbing tumour immediately above and about the mid-length of the clavicle; six months after was affected with pain, &c. It slowly increased to present size, that of pigeon's egg, and was hardly perceptible when the patient was in the recumbent position.

CASE 107. *Cooper, San Francisco*.—"From the extent of surface which was found to be the seat of pulsation, I was led from the first to think that the subclavian was implicated in the aneurism, though the history of the case rendered it almost conclusive that the primitive carotid had been originally the seat of the disease."

CASE 109. *Gore*.—About three years since he first noticed a small lump in the right axilla, which increased gradually in size, and in two months afterwards became painful. The tumour remained, not enlarging, up to six months since, when the swelling suddenly increased in size, and began to pulsate sensibly; it then extended upwards in the axilla and towards the chest, and continued enlarging in size. The aneurism formed a large tumour in the axilla, extending upwards under the pectoral muscle and the clavicle to a spot between the scaleni, where the artery could be felt distinctly dilated.

CASE 111. *Dr. Smyth*.—Six weeks ago noticed small tumour above clavicle, which gradually enlarged to size of an orange; was circumscribed, round, and filled up posterior triangle of neck.

CASE 112. *Liston*.—Four and a half months ago tumour of size of a hazel-nut, above the right clavicle. Has been kept in bed, and taken digitalis, and galvanism had been applied on several occasions (see Galvano-puncture). It increased, and is now the size of a hen's egg.

CASE 113. *Parker*.—About fourteen months back a swelling, about the size of a walnut, made its appearance above middle of right clavicle, without any assignable cause. This remained of same size for seven months, when it gradually increased to size of hen's egg; and at the end of a year it rapidly enlarged, and produced much distress from pressure on the nerves.

CASE 118. *Butcher*.—For fully four months after the strain (six months ago) flying pains attacked the root of the neck and fore part of the shoulder, sometimes better and sometimes worse, when he detected a small beating tumour in the neck, which was considered of no great consequence, and was supposed to be connected with the rheumatic affection; the pains became more developed and constant; the tumour gradually increased to its present condition, filling up the depression situated between the anterior edge of the trapezius, the posterior margin of the sterno-mastoid, and the clavicle below; it formed a remarkably globular tumour, about the size of half a large apple.

II. Cases of the diffused form of aneurism.

CASE 1. Boucher.—Skin discoloured, black, livid, sphacelated to extent of palm of hand. Aneurism enlarged towards shoulder and side of neck, occupying a space twenty inches in circumference by ten to eleven inches in oblique diameter; it extended to scapula behind, and in front to chest, as far as third rib. Luxation of shoulder, *i. e.* clavicle displaced from sternum several fingers' breadth; the scapula displaced. Shoulder-joint and acromio-clavicular articulation entire.

CASE 2. Hodgson.—Extended half way up the neck, and somewhat below clavicle; skin over it livid.

CASE 5. Burton.—Integument of left clavicular, mammary, axillary, and scapular regions greatly distended, tense, and livid, simulating fungoid tumour. Gave way suddenly about the base of the left scapula.

CASE 7. Ogle (Rogers).—Tumour above and below clavicle occupying upper part of thorax and axilla, producing displacement of clavicle and scapula, and extending above clavicle into neck as far as to within two inches of the occiput. Arm assumed a grotesque appearance, like that of a stuffed cylindrical cushion. Skin gave way at highest point of tumour, which had gradually been getting red, nearly a pint and a half of bright-red blood pouring out in a continuous stream.

CASE 8. Holmes.—Large tumour above clavicle, extending across the triangle from under sterno-mastoid muscle, rounded, and reached upwards half way to jaw; then diminished in size; but subsequently reached axilla, and extended considerably further.

CASE 10. Colles.—Tumour size of pullet's egg, enlarged and extended down to eighth rib, and from nipple across to arm. Three large ulcers a little below and before axilla.

CASE 18. Guthrie.—Increased to size of forty-eight-pound shot, pushing up clavicle, and forced its way into right cavity of chest by absorption and removal of first five ribs, becoming united to lung, and finally opening into it.

CASE 19. Auchinloss.—Size of Spanish nut; enlarged; pushed trachea to one side; sterno-mastoid much stretched; became half as large again as a child's head at birth, occupying entire right side of neck, from clavicle and sternum to lower jaw, pushing larynx and trachea two inches over to left. Integuments began to point, and soon formed a conical projection, larger than an egg; skin very thin, tense, of a dark-red colour, and seemed on point of bursting, but this did not take place.

CASE 21. Clivier.—The four first ribs appeared sunken into the chest, forming a notable depression; the arm forced away from body; the scapula and clavicle thrust outwards and upwards. Tumour extended above clavicle, upwards to parotid region, and angle of jaw; passed backwards beyond point of spinous process of vertebra and ribs; invaded fossa, and raised and pushed in front and upwards the scapula, and became prominent under the pectoral muscle in front. Skin adherent to tumour, but not discoloured in supra-clavicular region. Tumour consisted of three portions, supra-clavicular, axillary, and thoracic. Twenty-two centim. long and seventeen broad. It appeared above clavicle of the size of a hen's egg five months ago, and only last fifteen days increased to present size.

CASE 22. Wardell.—At first of size of section of small orange below middle third of right clavicle, extended downwards over thoracic region, from sterno-clavicular articulation towards axilla, and upwards behind superior edge of clavicle, being felt protruding there; increased slowly: clavicle became partly lost, as also articulation

sternum, and was irregular on surface; three nodulated swellings; conical prominence formed, and seemed as if pointing, having a brownish-purple, ecchymosed patch, clearly circumscribed, and about size of a crown piece. The tumour became of alarming size; integuments much discoloured; slight oozing of blood set in, which continued to increase, flowing slowly from an ulcerated orifice on the superior aspect, near the sterno-clavicular articulation. 10½ inch vertical, 8½ inch transverse, 8½ oblique diameter.

CASE 23. *Krackowitzer*.—At first size of hen's egg, only observed ten days before death, suddenly gave way, and produced an enormous tumour, which, commencing immediately under the chin, extended down to the clavicles; the lateral dimensions were limited by the trapezius on each side. It was of such a size, that at its highest point it was about two inches above the level of the chin. The larynx and trachea could neither be felt nor seen. The skin was distended to its utmost degree, so that there was not the slightest possibility of raising the smallest fold. On the right side the skin had somewhat of a doughy feel, and there were two or three ecchymotic spots upon the surface. Pulsation could easily be detected all over the tumour.

CASE 34. *Specimen*.—Aneurysm of subclavian, and death from its rupture.

CASE 37. *Guérin père*.—Tumour size of hen's egg, continued to increase to such an extent, that it reached from the interval between the second and third ribs up to the base of the jaw. The skin over it was tense, and very red, and rupture externally imminent.

CASE 37a. *Guérin fils*.—Seen by Boyer in 1812. Aneurism of enormous development. The tumour had occupied the anterior and superior part of the chest, and the whole corresponding side of the neck. He had for a long time been in a state of imminent suffocation, due to the deviation and pressure of the trachea.

CASE 40. *Oppolzer*.—Size of walnut, increased in two months, and extended from outer border of sterno-mastoid, downwards and outwards, close along upper border of clavicle, and backwards under the trapezius. It was three and a half inches long and two and a half inches broad, and projected one inch from surface. Continued to increase in size, and in five months it extended from clavicle to fifth rib, and reached under the scapula behind as far as the spine. It was of the size of a fetal head, and communicated through into the thoracic cavity.

CASE 43. *Penceast*.—In six months tumour was five inches in length, extending from sterno-mastoid to axilla, and downwards as low as third rib; shoulder much elevated.

CASE 44. *Dupuytren*.—Of about three months' duration, occupied axilla, elevating clavicle and pectoral muscle, forcing the arm from the side; no discoloration of skin, and no pulsation. Query clavicular abscess; exploration gave exit to arterial blood. It increased in size, and formed two tumours, one above the clavicle, embracing two inches of subclavian artery, and the other, the larger one, below, occupying the axilla. An eschar of one inch in diameter formed over it; hæmorrhage; prostration and death on following day.

CASE 46. *Lawrence*.—Tumour when observed at six months' duration occupied front part of chest, extending upwards behind the clavicle to the root of the neck, as an imperfectly circumscribed elastic swelling. Its upper edge could be distinctly felt two inches above the internal end of the clavicle, it extended downwards as far as the eighth rib. No prominent tumour presented itself, but on comparing his shoulder

in a front view a general fulness was observed, the outline of the clavicle was lost, and the hollow above it obliterated; the clavicle was not elevated and could be traced in close connection with the tumour, dividing the latter into a smaller superior and larger inferior portion. No discoloration of skin. Tumour continued to increase until his death by exhaustion and coma five months after admission. It occupied the anterior and lateral part of the chest, the entire concavity of the scapula, the clavicle and root of the neck; reached to the middle of the sternum in front, and behind to the inferior angle of the scapula, and contained three pints of blood. A large slough had formed at the back of the scapula, produced by lying and weight of tumour.

CASE 48. *Langenbeck*.—Size of pigeon's egg, and afterwards of closed fist, extending along upper part of clavicle to sternal articulation, obliterating supra-sternal fossa; he was obliged to sit up in bed, and leaning forwards to relax sternomastoid, which was stretched over tumour. This became reduced in size and its pulsation diminished, but had not entirely subsided when report was made two months after treatment by subcutaneous injection of ergot.

CASE 50. *J. W. Warren*.—At eight months' duration, tumour of a circumference of seven and a half inches over clavicle, its anterior and inferior portion being one inch from sternal end of clavicle, occupying whole triangle of neck above clavicle, and seemed rather to condense. (See Compression.) Several months after he fell on his shoulder, tumour became tender, skin over tumour tense and shining; had the appearance of a large abscess, and no tremor or pulsation in it. In three weeks began to point near middle of clavicle, and spontaneous rupture took place (about one year after first being seen by surgeon), profuse discharge of mixed pus and blood, dark and rather thick, about two quarts in quantity. Gradual decrease of tumour. The shoulder fell forwards; an opening remained in the integument, into which projected and pointed the carious humeral end of clavicle; sternal portion not visible; middle portion wanting. Presented himself one year after in good health, with arm in sling, and able to follow employment as ship's cook.

CASE 51. *J. M. Warren*.—Tumour of thirteen months' duration; from being of size of a pigeon's egg, it now extended along whole length of clavicle, and had three projections, occupying whole triangle of neck above the clavicle.

CASE 53. *Forbes*.—Size of hen's egg, of fifteen days' duration, extended rapidly and attained in ten days size of ostrich's egg. Punctured in three places and injected; rapid increase with external hæmorrhage; within ten weeks reached from angle of right inferior maxilla to the acromion, and from near the cervical spine behind to beyond the interclavicular space in front; head pushed over to one side and breathing very difficult. The clot seemed to be pressed from below upward continuously and quite forcibly, as if by the heart's action, thus causing it to protrude through the orifice at the top of the tumour, like a hernia, thereby preventing hæmorrhage. Death in thirteen weeks.

CASE 59. *Hilton*.—Of size of half an orange, reaching over first and second ribs; after various kinds of treatment sac gave way; general swelling of chest and surrounding parts, and of arms, and almost total stoppage of circulation in brachial artery. The tumour was of the size of a man's head, and occupied the upper part of left side of chest, filling whole of axilla, and laying bare the walls of the chest, eroding ribs and compressing lung towards spine: death from exhaustion, seven months after manipulation.

CASE 61. Cooper, Sir A.—Six months previously was very small and no pulsation to be discovered in it; but as the man had also a femoral aneurism, it was pronounced to be one of the subclavian artery; it felt like a tumour behind the subclavian artery. The tumour now occupied the whole of the left shoulder and greatest part of the clavicle, extending under pectoralis major. It was not red upon the surface but very hard, without any pulsation.

CASE 62. Porter.—About two and a half years. Tumour above middle of clavicle, small like a kernel, not painful, and increased very slowly. It now occupied the right side of the neck, of an oval form; its anterior edge reaching to the trachea, its posterior part extending beyond the edge of the trapezius; it passed more than half way up the neck, and its inferior margin rested upon the clavicle, which bone seemed to have been slightly depressed. The transverse measurement is $5\frac{1}{2}$ inches, and perpendicular about 3 inches.

CASE 65. Cusack.—Pulsating tumour in the axilla first noticed seven weeks before death. Sac gave way, filling the whole axilla, extending along the clavicle towards the sternum, and diffusing itself along the muscles and cellular tissue of the arm and side. The subclavian artery was pushed forward by it, so as to render it impossible to pass a needle round it without entering the sac, and this happened during operation, causing alarming gush of blood. Compression. Death in ten days. Cusack called it diffused aneurism of the subclavian.

CASE 78. Liston.—Size of a common football, occupying the whole axilla and extending upwards above the clavicle, thus forming a diffused aneurism.

CASE 97. Arendt.—Shoulder and clavicle pushed upwards, backwards, and outwards by a large tumour spreading from clavicle to nipple, through the axilla to the scapula, in length and breadth over 8 inches; about the middle of the clavicle an opening of the subclavian artery into the diffused aneurism. Caries of second and third ribs.

CASE 99. Mott.—Irregular in form, its size difficult to estimate, displaced clavicle an inch upwards. It rose above the clavicle in the form of two lobes fully another inch. Measured obliquely from lower part below clavicle upward and towards back of neck $5\frac{1}{2}$ inches. Another measurement crossing former at right angles 1 inch above clavicle was 4 inches; $2\frac{1}{2}$ on sternal side; $1\frac{1}{2}$ on cervical side. Its most prominent part was below clavicle.

CASE 114. Dupuytren.—Tumour about six months ago, of the size of a man's thumb; during two months he was under treatment by restricted diet, venesection and ice locally, when it became reduced to the size of a small bean. He resumed his usual work; for three weeks the tumour remained stationary, but after this time it rapidly increased, and rendered the motion of the arm every day more difficult. The patient was content to remain quiet and received no treatment until his admission into the hospital. There was now a large projecting tumour occupying the inferior part of the neck and resting upon the clavicle, which it covered a little in front without seeming to dip down behind it. The tumour commenced about $\frac{1}{2}$ of an inch from the right sterno-clavicular articulation and the trachea, and extended as far back as the inner edge of the trapezius; its vertical diameter was $2\frac{1}{2}$ inches, the transverse nearly $3\frac{1}{2}$ inches; the integuments preserved their natural colour. The circumference of the tumour was irregular, extending more upwards and inwards, where it approached the cricoid cartilage, than downwards and outwards; its limits could scarcely be defined by the touch.

CASE 117. *Canton*.—Three months ago was small and seated behind middle third of clavicle, it then became prominent both above and below that bone, extending obliquely 4 inches in an outward direction.

A third set of cases, consisting of fusiform aneurisms, might have formed a separate class, but these are included with the circumscribed variety.

10. *Symptoms of Subclavian Aneurism.*

The *symptoms* of a subclavian aneurism, beyond those of aneurism in general, are mainly the size of the tumour, its precise situation, and the results of its pressure upon the structures seated about it; thus, when occurring in the third portion of the artery, we may have pressure on the subclavian vein, and upon the brachial plexus and its branches, producing alterations in the circulation, disturbance of nutrition, and disturbance of sensation and motion in the upper extremity.

When seated in the first portion it may interfere with the trachea or œsophagus, causing difficult and stridulous respiration or difficult deglutition; and it may also cause dilatation of the veins of the neck and chest.

The anatomical relations of the artery will explain most of these symptoms, which also necessarily vary according to the course the tumour may take. Thus it may extend upwards into the neck, where, meeting with little resistance, it may reach as far as the jaw without producing any great pressure on the structures beneath; or it may pass inwards and involve the trachea and œsophagus, thus simulating carotid, innominate, or aortic aneurism; or it may extend outwards underneath the trapezius, and is then confined by the strong cervical fascia, so that it exerts pressure upon the brachial plexus and veins, causing the characteristic signs of subclavian aneurism in an alteration of the circulation, sensation, and movements of the extremity affected; or, lastly, it may pass downwards under the clavicle into the axillary and thoracic regions, eroding the clavicle and ribs, and here simulating axillary aneurism and aneurism of the arch, making their way externally.

The most unique case is perhaps that so ably depicted by Mr. Butcher in his '*Surgical Observations*;' it is case No. 118 in

our tables. It was one of aneurismal dilatation of the first and second portions of the right subclavian artery, with a large aneurismal pouch occupying its third portion. The account of the symptoms and physical signs is so graphic that we may take it as a standard description of a subclavian aneurism by dilatation due to atheroma, and I have thought fit to transcribe the details in full, as enhancing the value of these statistics.

Mr. Butcher writes as follows:—

“The following was his condition on admission to the hospital: first, as to his constitution. His face was thinned, though the body was not marked by emaciation; its colour, as well as that of the skin covering the body, closely resembled that of a tallow candle; his sleep was disturbed and unrefreshing, being frequently interrupted by exacerbations of pain in the limb and shoulder, and often dispelled altogether, so that he would rise up in the morning weak, dispirited, dejected; his appetite was small, capricious, not relishing animal food, while thirst predominated and was with difficulty assuaged; his pulse was weak and nervous, and exactly the same in number in both wrists; on the whole, the appearance of the man, to one accustomed to study the physiognomy of disease, bespoke some serious morbid lesion.

“Now as to the local changes: the tumour, its site, its influence on the vessel implicated, on the great trunk leading to it; the condition of the heart and the other contained thoracic viscera; and the state of all the abdominal organs. And, first, the tumour filling up the depression situated between the anterior edge of the trapezius, the posterior margin of the sternomastoid and the clavicle below; on the right side of the neck this remarkable globular tumour, about the size of half a large apple, was situated. The man, stripped, standing at rest, quiescent, revealed this tumour distinctly; and even when observed at a considerable distance, as acted upon, tilted forwards by an impulsive shock from behind at each stroke of the heart. Closer observation not only confirmed this momentary and oft-repeated change in its condition, but likewise detected an equable expansion propagated throughout its whole circumference, according to the position of the head, the relaxed or tense state of the mastoid muscle. The tumour was remark-

ably influenced when the head was slightly depressed to the affected shoulder; the mastoid muscle seemed elevated wise, by the influx of blood, while, on the contrary, when the neck was erect, and the head resting upon its proper axis, the muscle did not stand more forward or in stronger relief than its fellow on the opposite side, for the posterior edge of the muscle seemed to indent, or rather render more prominent the tumour hereabouts; on simple inspection there was a pulsatile motion internal to its sternal edge, and even beneath the sternum; the veins in this side of the neck were peculiarly turgid, particularly the external jugular, which, coming from above, was far larger than usual, while about its middle and lower descent numerous large communicating branches contributed to augment its bulk; inferiorly it coursed over the tumour and much increased in volume, dipped into the axilla about their usual place of junction. On placing the hand gently over the tumour it was readily tilted up; little deeper pressure, steadily continued, its contents completely emptied altogether, and the circulation arrested in all directions of magnitude beyond the point compressed; on lifting the fingers the rush of blood was impetuous to distend the vessel. Now the examination of the tumour, conducted after this manner, increased the man's suffering, but it afforded direct evidence as to the nature of the tumour and the state of its contents; in other words, the fluid blood distending the vessel occasioned by the ruptured coats of the vessel.

"On applying the stethoscope a distinct bruit was heard on the outer part of the tumour, and all over it to the margin of the mastoid muscle, while an indistinct tremor was heard beneath this muscle, while internal to it a very coarse murmur might, by acute observation, be detected, and might fairly be ascribed to regurgitation. On the most careful investigation nothing abnormal could be detected in the course of the art. innom., and no alteration from the healthy sounds of the heart, save that its beat was weaker than ought to be in a healthy man. The pulse, as I have pointed out, evidenced no alteration in either wrist from stroke of the heart's action; nothing retarded, impeded, or cut off the impulse communicated to the current, proper even along to the capillaries, so that here again is con-

evidence as to the fluidity of the aneurismal sac's contents, as demonstrated by the simple laying on of pressure, as already adverted to. On placing the naked ear upon the tumour, the result was startling; no words of mine can convey any idea of the sound, of the force of the incoming current up direct from the heart; whether this was augmented by the constriction exerted over a part of the tumour by the tense scalenus muscle it is difficult to determine, but to such a cause I would incline, and as likewise affording a solution as to the limited bruit so sonorous, yet restricted merely to the outer part of the tumour. On percussion the subclavicular regions were quite resonant and healthy, and, on the strictest examination, not the least aberration from the normal state could be detected within the thoracic parietes. The same careful examination of the abdominal cavity was made, particularly in reference to the descending aorta and vessels springing from it, but no departure from a sound state could be ascertained. After a most painstaking examination of the case, the conclusions arrived at were—that there was no internal disease, no change in the heart or great vessels to prohibit the prospects offered by operative surgery for the restitution of the lesion.

“All these things considered I determined on tying the subclavian artery in its first stage, but if frustrated, then to tie the innominate, and, if departure from a healthy state existed in it, then to ligate the right carotid in its first stage; and in a few days after, if necessary, the axillary artery.”

However, all cases of subclavian aneurism are not of this type. The common aneurism, resembling that met with in other parts of the extremities, will assume the ordinary characters of such aneurisms, which are so accurately described by all surgical authors.

Among the main points which arrest our attention is the condition of the limb on the side affected, and this has been endeavoured to be shown in the fourth column of the tables. However, I have thought it necessary for statistical purposes to give a second table, so that one may at a glance perceive the state of the circulation, sensation, motion, and temperature of the limb in such cases, so far as records have been preserved.

A. Cases of Circumscribed Aneurism.

No.	Size.	Pulse.	Sensation.	Motion.	Temperature, Edema, &c. &c.
14	Pigeon's egg	No pulse at all	—	—	Asphyxia.
38	Pullet's egg; increased to breakfast cup	Pulse natural, but became weaker and more irregular	Tingling and numbness	Partial loss of power	Temperature equable.
39	Hen's egg	No radial or brachial pulse	Pain and tingling	Unable to move arm	Coldness.
55	Deck's egg	Much weaker	Numbness and pain	Muscular system in good condition	Hand colder.
57	Small orange	No pulse at wrist	Numbness; gnawing pains; tingling.	—	—
68	Goose egg	Not felt at first, but subsequently	Rheumatic pains	Motion good	—
72	Half hen's egg	No pulse in radial, and feeble in brachial	Numbness	—	Coldness; hand pale.
73	Turkey's egg	Pulse full; labouring	Intense pain in axilla; numbness of whole limb	—	Arm œdematous, and somewhat livid.
74	Orange	More feeble and soft	Great pain	Partial paralysis	—
78	Size of foot-ball	Imperceptible	Loss of sensation	Loss of motion	Enormously swollen; temperature natural.
94	Hen's egg	Smaller than other	Numbness	Weakness	—
95	Small hen's egg	No difference in pulse	Most intense pain	Difficulty in flexing fingers	Limb swollen.
96	Large walnut	Pulse weaker	Sensation impaired	—	Slight œdema.
102	Goose egg	—	Severe pain	Loss of use	Swollen and inflamed.
103	Half a large orange	Full and frequent	Pain	Complete paralysis	Edema.
105	Small egg	Indistinct pulsation	Occasional pains	Occasional cramps	—
109	Indefinite	Pulse soft	Acute pain	Could scarcely raise arm	—
118	Hen's egg	Scarcely any pulsation	Considerable pain	—	—
115	Small apple	Much more feeble	Tingling in hand	—	Engorgement of whole limb.
•	Two fists. Traumatic	No pulse in arteries of limb	Most excruciable agony	Loss of motion of limb	Edema.

B. Cases of more or less General Dilatation of the Artery.

No.	Size.	Pulse.	Sensation.	Motion.	Temperature, Œdema, &c. &c.
18	48 lb. shot	Infinitely less power	Continual pain and numbness	—	Teasing cough.
45	Small apple	Almost imperceptible	Pain in shoulder; tingling and numbness in fingers	—	Enlarged superficial veins of neck.
48	Pigeon's egg, &c.	Stronger and later in beat than opposite	Pain in arm	Weakness of limb	Clubbed finger-ends.
49	Flattened hen's egg	Feeble pulse	Pain behind shoulder and in arm	Arm weak	No œdema; cold limb.
52	Size of filbert	No pulse	Great pain	Weak and useless	No œdema; cold limb; clubbed finger-ends.
70	Small; fusiform	Equal at both wrists	Numbness	Free motion	Coldness of limb.
71	Pyramiform	Very feeble	Pain and numbness	—	Œdema; temperature natural
80	Oval; conical	Brachial and radial scarcely to be felt	Pain and numbness	—	Swollen.
89	Conical	Equal at both wrists	Pain and numbness	—	—
91	Large	—	Darting pain; sense of weight	—	Œdema of whole limb.
93	Large	Full, soft, regular	Pain and numbness	Somewhat wasted	—
114	3½ in. by 2½ in.	Equal at both wrists	Numbness	Loss of motion; hand semiflexed	Œdema; temperature natural.
118	Half a large apple.	No alterations; nervous weak pulse	Unalleviable pains	Guarded motion from pain	—
119	Fusiform, whole length of artery	Almost imperceptible	Excruciating pains	Cramps and spasms	Œdema; congestion, threatening gangrene.

C. Cases of Diffused Aneurism.

No.	Size.	Pulse.	Sensation.	Motion.	Temperature, Edema, &c. &c.
2	Pullet's egg; became diffused	Rapid and weak	Considerable pain and numbness	Arm useless	Swollen.
3	Rapid enlargement	Became imperceptible	—	Arm useless; loss of power	Wasting of limb.
7	Enormous	Pulse stronger than opposite one; eventually failed	Numbness. Violent pain from chest to elbow	Loss of motion	Swelling; edema; blueness; clubbed finger-ends.
8	Diffused	Pulse fuller on affected side than other	Pain in shoulder	—	—
19	Became diffused	Pulse weak, but could be felt; afterwards imperceptible	Pains in shoulder; numbness in side of head and neck	—	Natural; attacks of asphyxia.
21	Hen's egg; became enormous	Pulse slight; flickering	Pain; tingling of fingers; numbness	Wasted; immovable	Edematous; coldness; left radial hard, and seemed ossified.
22	Small orange; became diffused	Feeble, and latterly scarcely to be felt	Acute rheumatic pains in shoulder; numbness	Weaker than other; became shrunken and wasted.	Anasarca of limb; hand swollen; fingers swelled, and turgid.
23	Hen's egg; when burst, reached to chin	Right pulse silent; left somewhat retarded	—	—	Great dyspnoea; suffocation.
37	Hen's egg; diffused, reached to jaw	Feeble pulsation	Great pain in arm; violent burning pain in tumour; numbness	Weak; difficulty in motion	Swelling; threatening suffocation.
40	Walnut; reached axilla, thoracic region, &c.	Pulse normal; became very weak; hardly perceptible	Intense pain	Weakness; but nutrition not affected	Temperature natural.
43	Diffused, 5 inches long	Extremely feeble	Intense pain	—	—

No.	very large; aneurism	Questionable pulsation	Limb acting pain; numbness; insufferable Excessive pain	Powerless	temperature augmented. Enormously swollen; cedematous. Shortness of breath. Threatening condition of limb; loss of sensation; cedema; pressure on trachea. Emaciation. Head blue and cold. — — Swelling.
50	Circumference of 7½ inches	No pulse at wrist			
51	Pigeon's egg; became large and 3-lobed; irregular	Pulse full	Sensation of weight and throbbing in tumour; great pain; numbness	—	
53	Hen's egg; rapid increase; became size of ostrich's egg	No pulsation in vessels of that side	Pain throughout limb, and located in middle of clavicle	—	
56	Small orange; burst; not very extensive	As distinct as usual	Great pain	—	
62	Kernel; became 5½ inches by 3 inches	None at wrist or bend of arm	Numbness and pain	Loss of motion	
65	Burst into axilla	Almost imperceptible	Most intense pain	—	
99	Very large; diffused	No difference in either	Pain in shoulder	Inability to raise arm	
117	Obliquity of 4 inches in thoracic region	Weaker than other	Constant pain; numbness in hand and arm.	—	

There were many peculiarities in the symptoms detailed in the reports of the several cases, which were due, for the most part, to deviations in the anatomical position and relations of the aneurism. Thus I have selected a few of the more prominent and marked symptoms, which are not all recorded in the tables.

A sense of suffocation observed in Cases 2, 15, 19, 23, 37, 37*a*.

A difficulty of breathing and dyspnoea in Cases 8, 14, 16, 30, 41, 46, 51, 53, 63, 72, 97.

A difficulty of swallowing in Cases 16, 30, 45, 72.

Hæmoptysis in Cases 4, 7, 18, 29, 45, 80, 116.

Giddiness and fainting in Cases 19, 49.

Sleepiness and indolence in Case 38.

Want of sleep and rest in Cases 48, 84, 87, 95, 96, 102.

Contracted pupil on affected side, remaining thus until death, Case 45; it occurred also in Case 95, but after ligature of the artery the pupil became dilated, owing, probably, to the taking off of pressure on the sympathetic.

Inordinate pulsation of the carotid on same side, Cases 37, 83, 113.

Absence of pulsation in the carotid on same side, Case 48.

Turgid condition of veins over aneurism, Cases 2, 8, 21, 45, 46, 55, 95, 118.

Peculiar clubbed condition of finger ends, Cases 8, 48, 52.

Complication with epilepsy, Case 21.

In the following cases one or more other aneurisms were present besides the subclavian aneurism.

A similar aneurism in the opposite artery, Cases 13, 26.

Axillary and popliteal aneurism, Case 24.

Axillary and aortic, Case 36.

Femoral aneurism, Cases 55, 61.

Axillary and popliteal, Case 24.

Two popliteal aneurisms, Case 49.

Ruptured popliteal aneurism, Case 6.

Aortic aneurism, Cases 30, 63.

11. ON THE DIAGNOSIS OF SUBCLAVIAN ANEURISM.—This is stated to be usually easy, and offering no point of a special character; such, however, is not always the case, as may be observed in several of the tabulated cases.

In the first portion of the right artery subclavian aneurism may simulate carotid, innominate, or aortic aneurism, and M. Nélaton has endeavoured to draw certain characters belonging to each, which may guide us in our diagnosis. Thus he states:—

In subclavian aneurism the tumour extends generally exter-

nally to the clavicular origin of the sterno-mastoid muscle, reaching the posterior and inferior triangle of the neck; becomes more elongated transversely than vertically; the bruit is propagated more towards the axilla than the neck, and remains the same on compressing the carotid; the radial pulse enfeebled; the limb painful and cedematous, and incommoded in its movements.

In carotid aneurism the tumour is seated between the sternal and clavicular origins of the sterno-mastoid muscle; becomes more elongated in a vertical direction than a transverse one; and on auscultation gives to the ear a *bruit de souffle* which is propagated more towards the side of the neck than the arm, with diminution of the arterial pulsation in the corresponding side of the face and cranium, and without weakening the radial pulse on the same side.

In innominate aneurism the tumour is placed under the sternum, or at the inner border of the sternal portion of the sterno-mastoid muscle, with weakening of the pulse in the subclavian and carotid arteries, and with absence of the other signs peculiar to the two other forms.

The following are some of the causes which may render the diagnosis difficult:—

a. *Glandular tumours* situated in the posterior triangle, extending downwards and lying over the artery, and receiving an impulse from below. This condition must be borne in mind, and may be diagnosed by the character of the pulsation, which in aneurism is equally distributed over the whole of the tumour; it is one of expansion and contraction, and may be modified by pressure on the artery on either side of the swelling. In glandular swellings the tumour may be lifted off the artery, and the finger readily inserted between it and the artery; the pulsation is faint, and only observed in the track of the vessel, and nowhere else; pressure on the artery does not affect it. However, small aneurisms with solid or nearly solid contents may be mistaken for glandular tumours; this was the case in No. 23, Krackowitzer's case, and in cases 109 and 44.

b. *Chronic tumour, not glandular.*—The same observation may be applied as in the foregoing. In case 50, one of undoubted aneurism, all pulsation ceased; some months afterwards

the part became tender to the touch, there was great pain, and the skin over the tumour was tense and shining, and the whole aspect was one of a large abscess; but the history of the case led the surgeon to diagnose it as suppurating aneurismal tumour.

In case 61, the tumour had, in the first instance, no pulsation of any distinctive character, and the previous history led to a difficulty of diagnosis; the tumour was small, and seemed as if seated over the subclavian artery, and receiving an impulse therefrom; however, as the man had a femoral aneurism, it was inferred that this tumour was also aneurismal, which eventually proved to be the case.

c. Chronic abscess.—One would hardly suppose it possible to mistake an aneurism for a chronic abscess, yet such was the case in No. 44, although the tumour was seated rather deeply in the axillary region, and, therefore, was more obscure. The particulars are mentioned at page 110. There was a distinct fluctuating tumour, in which no pulsation could be detected; and this, with the history and rapid development, led to the belief that it was an abscess. The error lay in not thinking of aneurism, and not employing pressure on the artery above the tumour; there was also an absence of radial pulse, a point which should always be looked upon with suspicion.

d. Exostosis of the first rib, pushing the artery before it, and thus giving a bend to the artery, simulating an aneurism. Several cases are on record, and I have selected one related in the 'London Medical Journal,' 1831, vol. 11, p. 40, as having occurred at the Middlesex Hospital, under Dr. Mayo. A man, æt. 58, about five months previously had begun to feel a pricking and thrilling sensation, extending from the right shoulder to the hand, which he attributed to his having walked several miles, a short time previously, with a load, which he carried principally on that shoulder. When seen by Dr. Mayo there was a prominent and pulsating tumour above the clavicle in the situation of the subclavian artery. Below the clavicle and the tumour the artery might be felt pulsating with ordinary force through half of the axilla, and at this point the artery had seemingly become obliterated. No pulsation was to be felt in any artery of the right arm below the middle of the axilla. After several very careful examinations the tumour

was found to consist of an exostosis of the size of a walnut, growing from the first rib. This exostosis had raised the artery and thrown it forwards; the artery was flattened by the pressure of the tumour, so as to present an unusual breadth, but it did not seem to be enlarged.

e. Neuroma of one of the nerves of the brachial plexus may be mistaken for aneurism, and this happened in a case related by Mr. Earle in the 'London Medical Gazette,' vol. xvi, p. 514, 1835, where the tumour was seated immediately below the clavicle, and therefore was rather axillary than subclavian. In this case the subclavian artery was tied with success. The tumour, when first seen, was found seated just where the subclavian artery passed beneath the clavicle; it pulsated and increased in a downward direction. The case was fully believed to be one of aneurism, and was recorded as a cure. However, the tumour increased in size, and the man died five years after of some internal disease, when it was discovered that the tumour was not aneurismal at all.

Earle's case, 'London Medical Gazette,' 1835, vol. xvi, p. 514.

Thomas B—, æt. 54, an iron-plate worker, was admitted into St. Bartholomew's Hospital, on March 25th 1830, with a pulsating tumour situated immediately below the left clavicle. He stated that it had been gradually increasing for ten months. On a careful examination, there was reason to suspect that the tumour was caused by an aneurism of the subclavian artery, at the spot where it passes beneath the clavicle. The tumour was of the size of half a large orange; its lower margin was firm, and no pulsation could be felt at this part, even when examined from the axilla; at the upper part the tumour was softer, and the pulsation very distinct. Moderate venesection performed, low diet and salines ordered; he could not take digitalis. As he complained of pain and heat in the tumour and down the arm, ice was applied. Under this treatment he improved and the pulsation diminished, the tumour remaining stationary. However, the tumour increased in a direction beneath the clavicle, so that, on April 14th, ligature of the subclavian artery external to the scalenus was performed. The aneurismal sac could be felt in the wound, raising the clavicle considerably above the first rib. The bulk of the tumour was very slightly diminished, and the contents of the sac felt very firm. He went on favorably for a few days; the ligature came away on the sixteenth day. Inflammation and suppuration took place around the tumour, which was evacuated by incision; thick unhealthy pus flowed out, which was supposed to consist of laminated coagula. After this the tumour subsided. He left the hospital convalescent and resumed his employment.

From 1830 to 1835 he was under occasional observation, and was twice admitted into the hospital with general anasarca and ascites. He died 2nd of July, 1835, from great exhaustion and general dropsy.

On examination the tumour was found to consist of a greyish dense substance, two inches long and about one and a half inch wide, having a large nerve of the axillary plexus attached to the upper end, and a similar nerve attached to the lower end; the axillary artery was firmly adherent to one side of it by dense cellular tissue. The subclavian artery on the distal side of the ligature was contracted to the extent of one and a half inch, immediately beyond which the artery itself was continued in its full diameter and its tube quite free. The walls of the artery were unaltered in texture.

f. Aneurisms of the innominate and aortic aneurisms are by far the most frequent diseases which may simulate subclavian aneurisms, and this not only in the first portion of the artery, but rarely even in its third portion. The whole of this subject has received great attention from surgeons in general, and from no one more minutely than Burns, in his excellent work on the surgical anatomy of the head and neck. At page 70 of his work he records a most interesting case of aortic aneurism simulating aneurism of the subclavian in its outer third, which is well worthy the perusal of modern surgeons. It was a case where an aortic aneurism was mistaken for a subclavian one. Mr. Burns says—"The nature of the disease appeared to be so decided, and its situation in the subclavian artery so clear, that on that subject there was no difference of opinion. Some were, however, of the opinion that an operation might be performed, while others were fully convinced that the case was hopeless. For myself, I must confess that in the early stage of the disease an operation might have been beneficial; those who dissented to it did it on the belief that the aneurism was seated so near to the origin of the subclavian artery, that to get beyond the limits of the disease, the ligature must have been passed round the arteria innominata—an operation, said they, for which there was no precedent. The great objection which we had to the experiment was the uncertainty with respect to the coats of the arteria innominata; we entertained no dread of the circulation being supported in the right arm." The tumour was the size of a pigeon's egg, situated just behind the right clavicle, and on the external edge of the sterno-mastoid. In this case the points worthy of notice were, the pulse in both arms being regular, and the right stronger than the left. The first appearance of the sac was nearer to the acromion than the sterno-mastoid muscle.

Mr. Burns says that in subclavian aneurisms an operation

ought never to be performed unless where the fingers can be insinuated between the tumour and the chest.

This opinion, however, must be received with some caution, inasmuch as aneurisms of the third portion of the subclavian, and likewise those affecting the whole length, may extend below the clavicle on to the thoracic and axillary regions, and again axillary aneurisms may extend forwards, and likewise upwards behind the clavicle.

The following are a few selected cases of other aneurisms simulating that of the subclavian artery, and mistaken for such in the early period of the disease :

Robinson's case of subclavian aneurism, described in the 'Lond. Med. Phys. Journal,' vol. lxiii, p. 285, proved after death to be an aneurism of the innominata and aorta.

One of Guattani's cases of subclavian aneurism is also shown in a sketch accompanying the case, to be one of aneurism of the innominata ('Scripta de Anev.,' 1777).

Wardrop's case, in page 109 of his work on aneurisms, although headed as subclavian, was an aneurism of the aorta and innominata.

Dr. Gairdner ('Provinc. Med. Journ.,' December 15th, 1854, p. 1126), at the Medico-Chirurgical Society, Edinburgh, on December 6th, 1854, showed a middle-aged patient affected with aneurism of the left subclavian artery, involving its inner third, and possibly the adjoining portion of the aorta. It passed rather backwards than forwards; there was extreme suffering in the arm and root of the neck, and contraction of the pupil of the same side. This case, however, subsequently turned out not to be a subclavian aneurism, but an aneurism of the aorta, projecting into the neck. Full details of this interesting case have been published by Dr. Gairdner in his work on 'Clinical Medicine,' at page 529 *et seq.*

Under the heading "Attempts at Operation on the Subclavian Artery," comprising cases 61 to 67, are given examples of the difficulties and errors in diagnosis as to the site and extent of aneurisms of this artery.

Dr. Cockle, in the 'Med. Times and Gazette,' 1863, vol. i, pages 504, 531, and 557, enters fully into the question of the diagnosis of aneurisms at the root of the neck. He quotes the case of a man, aged 45, who was admitted into the Royal

Free Hospital, for supposed subclavian aneurism, for which the treatment by galvano-puncture was adopted. The patient died, and it was found that there was aneurism of the ascending aorta and innominate and arch. The right subclavian artery arose distinctly from the sac, but was not involved in it. The canal of the artery was completely impervious; the right carotid also arose separately from the sac, but was quite pervious.

The following case, recorded in the 'Lancet,' April, 1841, p. 128, is well worthy of quotation :

John Rose, æt. 39, admitted into the Westminster Hospital on January 15th, 1841, with a pulsating tumour in the neck, supposed to be an aneurism of the right subclavian artery. He stated that about seven months ago, while performing extension of the arm during his exercise as a soldier, he had a sensation underneath and about the centre of the clavicle as if something had snapped, which occasioned him so much pain that he was obliged to fall from the ranks. About 14 days after this he observed a small tumour in the neck, in about the same situation as that in which he described having first felt the pain, which tumour had since gradually been increasing in size, but without occasioning him any constitutional disturbance up to the present time, it now being of considerable magnitude, extending as high up, or nearly so, as where the carotid artery divides into the external and internal, occupying the two inner thirds of the subclavian, and extending below as far as the second rib, having apparently occasioned the absorption of a portion of the first rib, as well as the sternal end of the clavicle. He was put on low diet, and after consultation, it was resolved that as, from the size and situation of the tumour, it was impossible with advantage to tie the subclavian artery, some means should be adopted for procuring a coagulum in the sac, and it was suggested for this purpose that the galvanic battery should be used, which was accordingly done on Tuesday, February 16th. Two needles of a curved form having been introduced into the tumour, a stream was made to pass through it of sufficient strength to coagulate the albumen. This was continued for about ten minutes, and occasioned the patient but little inconvenience, he merely complaining of rather an unusual heat in the part; the needles were then withdrawn, merely a few drops of blood following. The patient walked to his bed, and continued as well as usual for the remainder of the day.

February 17th.—The tumour, which before had merely a slight touch of inflammation on that part which was most prominent, has to-day a very inflamed appearance, extending over the whole surface, and he is suffering from pyrexia. Ordered calomel and antimony every four hours. There is much distress and irregularity about the pulse. On the following day he was better, and the medicine discontinued. A cold spirit lotion was applied to the tumour.

19th.—Inflammatory symptoms subsided. On removing dressings the puncture wounds seemed disposed to ulcerate. Lotion reapplied and a compress over it.

20th.—Tumour less red and appears much more solid, and pulsation diminished. Pulse less strong in right wrist than in left. Ulcer somewhat increased in size, and has small slough around margin.

No material change occurred until March 9th, with the exception of the tumour having become thinner at the point furthest from the heart. Then slight discharge of blood.

March 12th.—Hæmorrhage came on suddenly, tumour bursting at point of ulceration. Twisted sutures applied as soon as possible, restraining hæmorrhage, but the loss of blood was so rapid that the patient almost immediately afterwards expired.

Autopsy.—Tumour easily turned down over clavicle, being quite detached from the carotid artery, but lying closely upon it in its whole course, it having formed an adhesion to the sternum; the clavicle, to which it was closely connected, had its inner third absorbed. The aneurism rose from the anterior part of the arteria innominata, immediately before it divides into the carotid and subclavian, leaving them almost perfect. On minutely examining the aorta a second aneurism was observed, about the size of an egg, immediately above the heart. The heart was considerably enlarged.

12. THE NATURAL COURSE, PROGRESS, AND TERMINATION OF SUBCLAVIAN ANEURISMS can only be inferred from those cases in which active operative measures have been abstained from. Our tables furnish us, however, some data in this respect, although, unfortunately, many of the cases are without any detail. Taking then such as are sufficiently recorded, in which the aneurisms have been allowed to run their own course, or in which only internal remedies have been prescribed, we find that three results may ensue:—

1. A subsidence of the aneurism, termed a spontaneous cure.
2. A persistent state, the aneurism remaining in *statu quo* and the patient dying of some other disease.
3. A fatal termination either by ulceration and external hæmorrhage, or by bursting into the neighbouring organs or cavities, eroding the ribs, clavicle, &c., or by death from exhaustion.

In this category our collection comprises 49 cases, numbered 1 to 47 inclusive, besides the extra cases 37a and 12a.

Unfortunately, of fourteen of these cases there is nothing definite to be learnt. Either there are merely preparations in museums without history; or some other disease was associated with the aneurism, and, consequently, arrested its progress by causing the death of the patient. These comprise Nos. 6, 9, 13, 20, 24, 26, 27, 28, 29, 32, 33, 34, 35, 36.

We will, therefore, take such materials as are left for investigation.

1. *The spontaneous cures*, or cures effected without sur-

gical measures. Fourteen cases are recorded, Nos. 2, 3, 11, 12a, 30, 31, 37, 37a, 38, 39, 41, 42, 43, 47.

CASE 2. Hodgson.—Female, æt. 60. Right subclavian aneurism of five months' duration, with rapid increase, so that it was too advanced for operation. The tumour, however, insensibly diminished, the severity of the symptoms gradually abated, the pulsation became fainter, the pain subsided, and by degrees she recovered the free use of the arm. About eighteen months after the cure had taken place, there remained a small hard incompressible tumour. The pulsation in the axillary artery was feeble, but in the middle of the arm the pulsation was the same as on the opposite side. The arm was of its natural size, and she could use it for common purposes, but violent exertion produced pain in the situation of the tumour.

CASE 3. Orpen.—The aneurism was on the right side, and after enlarging rapidly and beating violently for some months, it suddenly lost its pulsation, and gradually subsided into a small compact swelling. The limb, however, continued useless, and in a state of extreme emaciation.

CASE 11. Porter.—The aneurism was on the left side in a male patient in the Stevens' Hospital. Mr. Porter writes: "I do not know but that gentle compression might have been attempted, but the position of the tumour was so unfavorable that such treatment could have had no very decided influence on the disease. Nevertheless, from day to day, the violence of the pulsation subsided, and the size of the tumour diminished, and he left the hospital well."

Porter also relates another case of recovery, Case 59, placed under the attempts at operation, and it is not at all unlikely that the endeavours to secure the innominate over a period of an hour and a quarter, might have effected the purposes proposed to be attained in these treatment by manipulation; at all events, from the moment when these measures were adopted a gradual diminution of the tumour ensued. In the course of two months the tumour was not of one quarter the size, and the pulsation scarcely perceptible. He was recovering both feeling and power in the arm; his health was excellent; and altogether he seemed as well as if he had never been the subject of so painful and perilous an operation. This tumour eventually disappeared, and he was able to return to his former occupation as a day-labourer.

Cases 30 and 31, quoted by Hodgson, are examples of a natural process of cure, effected in the one instance by compression of the artery on the distal side of the sac by means of an aortic aneurism; and in the other by compression on the proximate side of the sac. These will be again alluded to in the treatment of aneurisms by compression.

CASE 37. Guérin père.—Under the Valsalva treatment, in the course of a few

days there was marked relief; the tension of the skin diminished, the heat of the part abated, and the redness of the skin became less livid; a thrill still existed in the tumour, and the latter became more solid. Pulsation soon ceased, and the tumour became reduced to a small size, circumscribed, firm and painless, like a small egg. Two years afterwards it was found to be in much the same state, and the man was still able to follow his fatiguing employment as a carter in the harbour.

CASE 37a. Guérin, fils.—This case is recorded by Roux; and at the time he saw the man, the tumour had diminished considerably, and was limited to the inferior part of the neck; it was more elastic than soft and fluctuating; pulsation could be felt, but was very feeble and obscure; the pulse was also feeble in the arteries of the limb. The clavicle was destroyed about its middle to a certain extent. He could walk about, and was no longer subject to attacks of suffocation.

CASE 38. Yeatman.—The tumour, after undergoing a slow and steady increase, became (under Valsalva treatment and direct compression) remarkably tense, lost all pulsation, and slowly diminished. The arm recovered its former power, and the body its former strength and plumpness, the patient having been greatly reduced and emaciated by the treatment.

CASE 39. Cloquet and Bernardin.—During an attack of inflammation of the bowels, for which rest and energetic antiphlogistic measures were adopted, the aneurism of the size of a large egg was arrested in its progress, and became diminished in size, and about one year afterwards the tumour had decreased to the size of a large nut; it was round and firm, but still pulsating; the skin over it was natural in colour, and it was not painful on pressure. It became firmer and almost obliterated. The wasting of the limb, the feeling of cold and incapability of moving the arm still persisted, and showed obliteration of the vessels, indicated also by the cessation of pulsation in the brachial, radial, and ulnar arteries. In the course of time pulsation could be feebly felt in the brachial and radial arteries.

CASE 41. Lancisi.—The tumour and pulsation disappeared, although the artery was still dilated to a greater extent than natural. However, after a lapse of five years, the disease had not returned.

CASE 42. Lancisi.—The only notes recorded are, that the aneurism was treated in the proper way, and that the patient remained well for six years, when he was lost sight of.

CASE 43. Pencoast.—Aneurism was five inches in length, and reached as low as the third rib, occupying lower part of neck above clavicle, and extending from sternomastoid to axilla. Valsalva treatment; as the tumour became considerably larger, it was resolved to tie the subclavian. On the morning of the intended operation he was very weak, and had an attack of syncope; pulse 44; general coldness; profuse perspiration and nausea. On being brought into the operating theatre the patient fainted, and the operation was postponed. In the course of the evening it was found that the patient himself had taken thirty drops of the strongest tincture of aconite by mistake for digitalis, which thus readily accounted for his sudden prostration in the morning. From this time the tumour began to diminish and the pain to lessen. He left the hospital in six weeks' time relieved: all trace of the patient was lost for eight years, when it was ascertained that he had died in a military hospital of internal aneurism. The man had given an account of his expected operation some years previously; stated that, after he left, the tumour steadily decreased; and that, regaining

his health, he enlisted as a soldier. After death the original disease was found to have been in the subclavian artery, and what remained of it was small and firm.

CASE 47. *Lloyd*.—The case only remained under treatment for one month, but this was attended with considerable diminution and improvement.

2.—*The causes of death* in cases of subclavian aneurism, when not subjected to any surgical interference, were as follows :—

Cases 1 and 40.—Gradual exhaustion.

Case 10.—Irritative fever, suppuration and exhaustion.

Case 21.—Combined with epilepsy, the aneurism became diffused rapidly, and speedy death occurred from exhaustion.

Cases 8, 14, 15, 16 and 46.—In these death appears to have been due to dyspnœa, pressure on the trachea, and suffocation.

Case 23 is one of very rapid death from the bursting of a subclavian aneurism under the skin and fascia of the neck, producing the most frightful attacks of suffocation, the description of which is as follows :—

“ But the tumour still increasing, on examination a second time it was pronounced to be aneurism, and he was urged to go home in order that an operation might be performed. On the 25th of February he took the night train for New York. He felt very sick indeed, and was two or three times attacked with suffocation in the cars. He arrived on the morning of February 25th. On going towards home he was recognised by some friends, who were shocked by his condition and his great dyspnœa. With their assistance, however, he was able to walk up to the fifth floor of a tenement house. When he arrived in the room and took a chair he was seized with a frightful attack of suffocation. I found the patient sitting in a high-backed chair. The eyeballs protruded somewhat, and the right pupil was contracted, while the left was somewhat dilated. The face was of a dusky hue and bathed with perspiration. The breathing was loud and difficult, while the neck was disfigured by an immense tumour, which commenced immediately under the chin and extended down to the clavicles, the lateral limits being each trapezius muscle. The tumour was of such a size that at its highest point it was about two inches above the level of the chin. The larynx and trachea could neither be felt nor seen. The skin was distended to its utmost degree, so that there was not the slightest possibility of raising

the smallest fold. On the right side the skin had somewhat of a doughy feel, and there were two or three ecchymotic spots upon the surface. Pulsation could easily be detected by the eye almost all over the tumour, at least its right or most prominent portion. Applying the stethoscope a loud bellows murmur was detected, but no aneurismal thrill. The respiration was twenty-four per minute, very laboured, and there was no pause between inspiration and expiration. Sound on percussion normal everywhere; rhythm of heart perfect. Pulse in left wrist not accelerated, but rather somewhat retarded, while the right radial pulse was silent. After completing my examination he became bewildered, and had an attack of asphyxia; by rubbing the temples and neck with ice this paroxysm passed over, and gave way to dyspnoea of a more severe character. His consciousness seemed to have been lost. Reaction of the heart became vigorous again, and the pupils became of equal size. He remained in this condition up to twelve o'clock, p.m., when he began to move his hands. He arose about this time, and with support walked through a large room and sat down on his bed. He was propped up in a recumbent position when shortly after he began to talk incoherently of matters connected with military life, and quietly died."

Case 19 was one of sudden death, and remarkable for the peculiarity of the immediate subsidence of the tumour at the time of dying, so as to have led to the supposition of an internal rupture of the sac, but such was not the case, for it was found that the fluid contents of the aneurism had flowed out into the larger vessels of this body.

Cases 5, 7, 22, 44, and probably 34 and 35.—In these death occurred from rupture of the sac externally, giving rise to fatal hemorrhage.

Cases 4, 18, 29, and 45.—In these the aneurism burst into the lungs, bronchi, and trachea, thus causing death.

13. THE DURATION OF SUBCLAVIAN ANEURISM.

The investigation of this point is fraught with much difficulty, for the aneurism often was not discovered until it had attained a moderate size, when it had made its appearance above

the clavicle, so that in using the term duration of the disease we date the disease only from the time when it was first discovered, although in all probability it had existed long before, when the patient complained of having suffered from rheumatic pains, weakness of the extremity, &c., the usual premonitory symptoms of the disease. Again, in looking over the details of the cases, it appears that the narrator has endeavoured to associate the date of origin with some injury, and has set down the commencement of the disease to such a period. We must, therefore, regard this point as only guiding us very imperfectly as to the length of time the disease might have existed previous to its coming under the hands of the surgeon.

We have, therefore, to look at this question in several points of view :—

1. The duration of the disease, prior to any treatment having been adopted.

2. The duration of the disease subsequent to treatment, taking the several methods into account with a view to determine the duration of life accorded by them.

I propose entering upon these investigations by means of the following tabular details :—

SUMMARY OF DURATION OF LIFE.

A. Those in which no treatment is recorded,—36 cases.

Three underwent cure,—cases 2, 3, 11.

Two were found to have undergone a natural process of cure—cases 30, 31.

In fifteen cases there were either preparations of the disease only, or the duration of life had not been recorded.

So that we have only sixteen cases from which to form any satisfactory conclusions ; and these I have placed in a tabulated form, in order to simplify the matter.

No.	Probable duration before observation.	Size at time of observation.	Duration after observation.	Size acquired. Result.	Total duration of disease.
1	2 years	Enormous, diffused	Some time	—	2 years and some time.
4	8 months	Chesnut	16 days	Burst into bronchi	8 months and 16 days.
5	—	Large, diffused	12 weeks	Burst externally	12 weeks after observation.
7	Probably 2 years	Small	8 months	Enormous; burst externally	2 years and 8 months.
8	6 months	Diffused	1½ years	Diminished and became harder; dyspnœa; death	2 years.
9	Uncertain	Pigeon's egg	2½ years	Remained of same size	Death from other causes.
10	Uncertain	Pullet's egg	Some months	Suppuration and hæmorrhage	Uncertain period.
13	—	Hen's egg	—	Became somewhat larger	Stated to have existed 24 years.
14	8 years	Pigeon's egg	A few days	Death from asphyxia	8 years and a few days.
15	Some months	Large	Lingered 1 year	Asphyxia	1 year and some months.
16	Uncertain	Large	15 months	Dyspnœa	Over 15 months.
18	1 year	Small, hard	3 weeks	Size of 48 lb. shot; burst into lung	1 year and 3 weeks.
19	14 months	Spanish nut	5 months	Became diffused	1½ years.
21	5 months	Hen's egg	15 days	Became diffused	5 months and 15 days.
23	Uncertain	Hen's egg	10 days	Diffused; asphyxia	Uncertain period.
24	7 months	Hen's egg	2 months	Same state	Death from other causes.

2. Those which were treated more or less by the Valsalva method and by internal remedies—12 cases.

Seven are recorded as having undergone spontaneous cure, but one of these, case 47, was only under observation a month, and the process was not completed. In another case, No. 38, the treatment was carried out for a period extending over one year and a half; a third case, No. 37, was seen two years after the cure, when there remained only a small inelastic tumour; in a fourth case, No. 43, the patient lived eight years, and then died of severe internal aneurism.

Five patients died, and the duration of their lives was as follows:—

No.	Probable duration before observation.	Size at time of observation.	Duration after observation.	Size acquired. Result.	Total duration of disease.
22	Many weeks	Small orange	9 months	Diffused	9 months and many weeks.
40	3 months	Walnut	6 months	Diffused	9 months.
44	2 weeks	Almond	6 weeks	Diffused, punctured for abscess	2 months.
45	8 months	Apple	4 months	Diminution ; burst into trachea	12 months.
46	6 months	Gradual enlargement	5 months	Large diffused ; pressure on trachea	11 months.

c. The case which underwent the treatment by moxa and hypodermic injection of ergot was, at the end of five years and one month, still in process of cure.

d. Those in which compression was used were four in number, and all were cured.

e. Of the two cases treated by injection into the sac,—immediate death followed in the one, and in the other death ensued thirteen weeks after the first discovery of the tumour.

The remaining cases I have tabulated, so that my reader may have a *coup d'œil* of the duration of life in cases treated by the various methods mentioned in my principal table.

No.	Time.	Size at time of observation.	Treatment.	Time.	Result.	
55	14 months	Increasing up to duck's egg	Acupressure on distal side successful; acupressure of innominate led to sloughing and death from hemorrhage formed	2 months; death	Tumour remained the same	16 months; died.
56	2 years	Gradual up to size of small orange	Manipulation without any benefit	8 months	No effect; subsequent giving way of sac; death	Lived 2 years 8 months.
57	9 months	Small orange	Manipulation	2 years	Gradual disappearance	Cured; gradual disappearance; 2 years 9 months
58	8 months	Goose's egg	Manipulation	15 months	Gradual diminution	Continued to size of walnut; 2 years.
59	Not stated	Half an orange	Manipulation; diffused aneurism supervened	9 months	Attained enormous size	Died 9 months after treatment.
60	Long time, remained stationary 3 months, increased in size 6 months	Hen's egg	Galvano-puncture; cold application and compress	3 weeks	Tumour half the size	Seen 2 years afterwards, and no return.
61		Small at first; became very large	Attempt at operation of ligature of subclavian	6th day	Death	6 months 6 days.
62	24 years	Slow growth; 5½ by 3 inches	Attempt to tie innominate	—	Gradual diminution	7 years after entirely disappeared.
63	3 months	Pigeon's egg	Ditto	23rd day	Death	About 4 months.
64	5 months	Circular basis of 5 inches	Ditto	3 months	Ditto	8 months.
65	Not stated	Sac gave way	Attempt to tie subclavian	10 days	Ditto	10 days after attempt.
66	Not stated	Half an orange	Ditto	—	Not stated	Death soon after.
67	Not stated	—	Ditto	—	A few days after he died	No account.
68	6 months	Goose's egg	Ligature of 3rd portion of subclavian artery	5 days	Gangrene of limb; death	6 months and 5 days.
69	3 months	Swan's egg	Ditto	4 days	Punctured sac; death	3 months and 4 days.
70	2 months	Small lemon	Ditto	6 days	Suppuration and inflammation; death	2 months and 6 days.
71	18 months	Pyriform	Ditto	3 days	Apoplexy; death	18 months and 3 days.

No.	Duration before observation.		Treatment.	Duration after operation.		Total duration.
	Time.	Size at time of observation.		Time.	Result.	
72	2 months	Half hen's egg	Ligature of 3rd portion	—	Recovery	Seen 9 yrs. aft. quite well.
73	6 weeks	Turkey's egg	Ditto	15 days	Pleurisy and pneumonia	6 weeks and 15 days.
74	2 years	Orange	Ditto	12 days	Hæmorrhage	2 years and 12 days.
75	4 months	Orange	Ditto	65 days	Hæmorrhage and pyæmia	4 months and 65 days.
76	Short time	Hen's egg	Ditto	—	Recovery	—
77	Not stated	Small size	Ditto	—	Ditto	—
78	9 months	Tumour observed 9 weeks; foot-ball	Ditto	14 days	Hæmorrhage	9 months and 14 days.
79	4 months	Pigeon's egg	Ditto	—	Recovery	—
80	4 months	Oval	Ditto	—	Ditto	—
81	Not stated	—	Ditto	—	Not stated	Death.
82	4½ months	Hen's egg	Ditto	—	Recovery	—
83	6 months	Goose's egg	Ditto	29 days	Hæmorrhage; death	6 months 29 days.
84	3 weeks	Large	Ditto	8 days	Ditto, ditto	3 weeks 8 days.
85	Not stated	Half hen's egg	Ditto	35 days	Ditto, ditto	Not stated.
86	6 weeks	Large	Ditto	—	Recovery	—
87	Not aware of it	Half hen's egg	Ditto	—	Ditto	—
88	4 months	Hen's egg	Ditto	—	Ditto	—
89	4 months	Conical	Ligature of 1st portion	9 days	Wound of pleura; hæmorrhage; death	4 months and 9 days.
90	2 years	Hen's egg	Ditto	19 days	Hæmorrhage; death	2 years and 19 days.
91	10 months	Large	Ditto	12 days	Ditto, ditto	10 months and 12 days.
92	3 months	2½ by 2 inches	Ditto	23 days	Ditto, ditto	3 months and 23 days.
93	5 months	Large	Ditto	4 days	Pericarditis; pleurisy, do.	5 months and 4 days.
94	7 months	Hen's egg	Ditto	36 days	Hæmorrhage, ditto	7 months and 36 days.
95	4 weeks	Small hen's egg	Ditto	15 days	Ditto, ditto	4 weeks and 15 days.
96	9 months	Large walnut	Ditto	11 days	Ditto, ditto	9 months and 11 days.
97	Not stated	3 inches by 2	Ditto	5 days	Pus in mediastinum, do.	5 days after operation.
98	10 weeks	Large and diffused	Ditto	24 hours	Hæmorrhage; bursting of sac; death	10 weeks and 24 hours.

99	3 months	Large and diffused	Ligature of innominate	26 days	Hæmorrhage; death	3 months and 26 days.
100	Not stated	—	Ditto	67 days	Ditto, ditto	67 days after operation.
101	Not stated	—	Ditto	60 hours	Ditto, ditto	60 hours after operation.
102	1 year	Goose's egg	Ditto	8 days	Pyæmia, &c., ditto	1 year and 8 days.
103	8 months	Half large orange	Ditto	5 days	Hæmorrhage, ditto	8 months and 5 days.
104	2 years	Pigeon's egg	Ditto	18 days	Ditto, ditto	2 years and 18 days.
105	4 months	Small egg	Ditto	21 days	Ditto, ditto	4 months and 21 days.
106	Not stated	—	Ditto	Not stated	Ditto, ditto	Death.
107	Not stated	Large	Ditto	9 days	? Pyæmia, ditto	9 days after operation.
108	Not stated	Large	Ditto	34 days	Hæmorrhage, ditto	34 days after operation.
109	3 years	Remained small for 2½ years, then rapid increase from axilla to scalenus	Ditto	17 days	Ditto, ditto	3 years and 17 days.
110	Several years	Pigeon's egg	Ditto	48 hours	Pus in mediastinum, do.	Several yrs. and 48 hours.
111	3 months	Small orange	Ligature of innominate, carotid, and subsequently vertebral	—	Recovery	—
112	6 months	Hen's egg	Ligature of 1st portion of subclavian artery & carotid	13 days	Hæmorrhage; death	6 months and 13 days.
113	7 months	Hen's egg	Ligature of innominate, carotid, and subsequently vertebral; all performed at same time	42 days	Ditto, ditto	7 months and 42 days.
*	2 months	Tolerable size	Ligature of 1st portion of subclavian artery & carotid	10 days	Ditto, ditto	2 months and 10 days.
114	5 months	3½ by 2½ inches	Ligature of axillary, distal operation	9 days	Hæmorrhage, ditto	5 months and 9 days.
115	3 months	Small apple	Ditto	13 days	Ditto, ditto	3 months and 13 days.
116	6 months	Half an egg	Ditto	25 days	Ditto, ditto	6 months and 25 days.
117	3 months	4 inches, oblique	Ditto	19 days	Ditto, ditto	3 months and 19 days.
118	7 months	Half large apple	Ligature of carotid	4 days	Sudden prostration, ditto	7 months and 4 days.
119	2 years	Large, fusiform, whole length of subclavian artery, joint	Amputation at shoulder	—	Recovery	Died 4 years after from internal aneurism.

14. STATISTICS AND REMARKS ON THE VARIED METHODS OF TREATING SUBCLAVIAN ANEURISM.

This last important investigation I am compelled to defer until the next volume of these Reports shall be in progress. I have already taken up too much space, and the materials collected under the last heading comprise a great deal of useful matter, which would hardly bear compression.

APPENDIX.

One very serious omission has been committed by me; the very valuable case of aneurism affecting both subclavian arteries in the same patient, which came under the notice of Mr. Gamgee of Birmingham, and Mr. Heath of University College Hospital, was mislaid, and the whole of the statistics were printed and revised before the error was detected. I could not possibly manage to insert all the special details in their appropriate places in the statistics, and therefore I am compelled to give the case as an appendix, and to request those interested in the subject to bear in mind the omission.

The case would come in very well between Nos. 12 and 13; after Vacca Berlinghieri's case of aneurism affecting both subclavian arteries. I have, therefore, tabulated it as 12*a*. In it there were two spontaneous aneurisms, not traumatic, extending over a period of four years and four months; the left one was cured spontaneously; the right one, of more recent formation, was increasing slowly, when the man died from the bursting of an aneurism of the aorta into the left bronchus. The post-mortem examination showed arterial disease of an extensive character.

The notes are taken from the 'Transactions of the Clinical Society,' vol. ii, p. 8, furnished by Mr. Christopher Heath.

Sex.—Male.

Age.—Fifty-two.

Occupation.—Ropemaker. Always enjoyed good health.

Probable cause.—About four years ago suffered from what he called rheumatic pains in the shoulders, but continued his

work for six months, when, in consequence of pain in the left shoulder, he was obliged to give up, and was admitted into the Birmingham Hospital, when an aneurism of the left subclavian artery was discovered of considerable size, thrusting the clavicle forwards.

Progress and treatment.—He remained in the hospital about nine weeks, where dietetics and medicinal measures were adopted without any relief; the left arm, which was much wasted, was twice galvanised. He returned to the hospital six months afterwards, and remained for some weeks, during which period spontaneous cure was effected without any mechanical treatment.

Results.—After this he returned to his old employment, using his right arm almost entirely for the purpose of drawing out the hemp, and continued to do so for a period of sixteen months, when he began to suffer from pain and loss of power in the right arm, which compelled him to give up work about six weeks before his present admission, and during this latter time he had been in the Union.

Present condition, July 30, 1868.—There was a pulsating tumour of the size of a hen's egg above the right clavicle, extending from the outer edge of the sterno-mastoid muscle for about two and a half inches, and reaching to one and a half inch above the clavicle; there was no bruit; the patient complained of pain occurring in the part at intervals, and extending to the tips of the fingers. The right pupil was much contracted, the left somewhat dilated, but active. No evidence of disease of the heart or great vessels. On the left side there was no evidence of tumour, the inner half of the clavicle was forced forwards, and the bone appeared thickened behind; there was no pulse perceptible in the left limb, which was much wasted.

Treatment of right subclavian aneurism.—The arm was carefully bandaged from the fingers, forearm flexed and confined to the side; recumbent position; no stimulants; moderate meat diet, with milk. Iron and digitalis internally. Under five weeks' treatment the patient's health began to suffer, and the aneurism had decidedly increased in size. The bandages were removed, the patient was allowed to sit up, and a liberal mixed diet with wine was prescribed.

Progress.—The aneurism increased in the direction of the

innominata, causing huskiness of voice, the arm became numbed, and the pulse intermitted. An attempt was made to apply pressure to the subclavian artery on the distal side of the aneurism, by digital pressure under chloroform; this was continued for the space of an hour, but without effect. From this time no special treatment was adopted; the patient had an attack of bronchitis, and he remained in *statu quo* until November 21, 1868, when he coughed up a little blood, which was followed by the expectoration of a considerable quantity of arterial blood, and the patient sank.

The dissection of the parts is recorded in the 'Trans. of the Path. Soc.' 1869, p. 123. The innominate artery was healthy, but the root of the right carotid, and the whole of the right subclavian, as far as the vertebral artery, were dilated to a size equal to that of the innominata. Beyond the vertebral artery was a large sacculated aneurism, from the fore part of which the thyroid axis came off. The aneurism was of the size of an orange, and projected upward as high as the first cord of the brachial plexus, and downward into the thorax, the pleura being reflected over it. It was covered by the scalenus anticus, the fibres of which were reduced to a fibrous aponeurosis, and it was crossed by the phrenic nerve. The third part of the subclavian beyond the tumour was dilated for about an inch.

The left carotid was normal, and the left subclavian, immediately after giving off the vertebral artery (which was pervious) was occluded and imbedded in a mass of fibrous tissue, in which it was impossible to recognise the artery, and the vessel could only be distinctly seen an inch beyond the lower border of the first rib. The arch of the aorta showed in its ascending portion two sacculated aneurisms, one of small size, at the posterior part, an inch above the valves; and the other, of the size of a chesnut, involving the right side of the vessel a little higher up. At the junction of the arch with the descending aorta was a small aneurism, which had burst into the left bronchus immediately below the bifurcation of the trachea, giving rise to fatal hæmorrhage. Below this again was another aneurism of the aorta of the size of a filbert. The heart and valves were healthy.

SOME REMARKS
ON
SYPHILIS AND CHANCERE.

BY J. COOPER FORSTER.

A VERY large number of cases of venereal disease have been seen by me during thirteen years' connection with Guy's Hospital, as assistant surgeon. The following paper embodies some of the results of my experience; the subject is one that had not attracted the attention of writers in our Reports for several years, until an able article, written by Dr. Wilks, appeared a few years ago in the Third Series, Vol. IX, followed by another from the pen of Dr. Moxon, in Vol. XIII. These papers, however, deal with the more advanced forms of the disease, with what may be considered the forms of constitutional syphilis seen by the physician, viz. when it attacks the internal organs, though he now lays claim to the treatment of the disease from its commencement.

The idea I have in this paper is to place before my readers, many of whom are old pupils and have followed my teaching, the views of syphilis taught by me at Guy's Hospital at the present time, in what may be considered its surgical aspect. I trust they may thereby see the phases that this inexhaustible subject has undergone, and obtain an insight into the views which I now hold, obtained from as large an opportunity of studying syphilis, &c., as any place in London can afford. Part of Patience Ward, with its thirty beds, a great number of out-patients, and a very fair share of private patients affected with venereal disease,—and from these last facts, as a rule, are

more easily to be obtained,—have been my sources of information, with a careful attention to most of the writings of the present day.

There is no doubt that a very great change has taken place in the general knowledge of this disease since Ricord's grand ideas were first made known. I confess to having begun again as a student since that time, almost, I may say, ignoring the theoretical and part of the practical instruction given me whilst a pupil, whether at Guy's Hospital or in that great field for studying syphilis, the "Dreadnought" Hospital Ship.

Of course all sores on the generative organs are not syphilitic; this must be, or ought to be, patent to every one; but that a very large proportion are of a suspicious character it behoves every surgeon also to bear in mind, however much he may desire to please his patient by seconding the doubts so often raised in the matter. Another portion of the public believe all sores occurring on the genital organs to be contracted, either directly or indirectly, from the opposite sex, and it requires sometimes considerable experience to be enabled to judge rightly. Wherever there has been a connection suspicious to the surgeon's mind—I am not alluding to the mind of the patient, who, in many cases, has no suspicions,—the doubt ought always to be given in favour of the sore being the result of that intercourse, certainly as regards its treatment. Not only sores, but also abscesses occurring in the labia, are often attributed to some infection having been communicated on the part of the man. More than once I have been called to appease the wrath of an angry wife and mother-in-law on this point. I was called one Sunday evening some years ago to see a lady suffering severe pain in the right labium; she gave me the following history. Her husband had been away several weeks, and had returned home eight days; immediately on his return connection followed rather inordinately; in a few days she began to experience pain, and swelling took place. She was suffering severely in the right labium when I saw her, and would not allow her husband any further intercourse. Mutual recriminations and threatenings took place on both sides, and I was called to decide in the matter. The lady had simply an abscess in one labium, and this set the whole question at rest. There was no disease, commonly understood by that term, of

the generative organs, and I believe the abscess to have been the result of imprudence on the part of both, as I have since known to occur in similar cases.

Again, I was called to see a man with a sore on the penis, very large, hard, raised considerably, but regular, and the surgeon was about to amputate the organ, judging the case to be an epithelial cancer, as the man was above suspicion, honest, hardworking, and married. I urged delay, and time soon proved the diagnosis I formed to be correct. This sore had existed nine weeks, and there was a late appearance of the secondary eruption, which induced the surgeon with whom I saw the case to think of performing the operation of amputation.

One might relate numerous instances of a similar character, showing the necessity of the greatest caution being exercised in pronouncing a sore to be the result of impure connection or the reverse. Herpetic eruptions are frequently seen on the penis; nay, some patients are scarcely ever free from them, and they have assured me that these crops of herpes have occurred more frequently when they have abstained from sexual indulgence than at other times. Men who are not habitually very cleanly frequently have the mucous membrane of the glans devoid of epithelium, and even present small sores which may be mistaken for sores of a soft character, or even syphilis; and should these be seen in a patient who has had a suspicious connection a day or two before, there are no means by which they can be diagnosed except by inoculation, to which I do not find the public very willingly submit. That in by far the larger number of cases of venereal disease there is no difficulty in deciding as to the character of a sore, there can be no doubt; but that there are likewise other cases in which it is impossible to speak positively, must be allowed. I have seen sores on the generative organs of young children, about which no one could speak positively, and yet one reads of most decided opinions unhesitatingly expressed in our police and other courts, upon what I fear to be very limited experience.

I hold that there is but one true syphilitic poison, one sore which should be called syphilis. The division into what are called "hard and soft chancres" is, to my mind, objectionable, as the amount of hardness around what is known as a hard "chancre" is often not of a typical character, that is to say,

it may be more than what one usually feels in a true hard sore or the amount of hardness may not be as much as you sometimes feel around a soft sore, especially when that sore occurs on certain parts, for instance, on the prepuce. I, therefore, think it would be better to do away altogether with the term "hard chancre," and call the sore which I wished to designate when using that term, as syphilis. You would speak of a patient as having syphilis, and when you wished to designate a local appearance, as having a sore, or a hard sore. The name "soft chancre," again, is apt to mislead; "chancre" is a term to be used. I am constantly asked by students, Will that soft chancre be followed by secondaries? showing that the word chancre is associated in their minds with true syphilis, constitutional poisoning. We then have two poisons, one true syphilis or constitutional disease, and the other a mere local mischief, a chancre. I am aware that in attempting to alter the nosology of disease, one is meddling with a very serious subject, still I think that the terms hard and soft chancre though sanctioned by the Nomenclature Committee of the College of Physicians under the comprehensive title of syphilis are open to this very serious objection, that in the one case we are speaking of a disease which is frequently as great a curse as can fall upon any human being, in the other we are denoting a harmless local disease, attended by no ulterior consequences, or, at the worst, only loss of substance or cicatrization of the generative organs or in the groin, and certainly not as after mischief.

It is often said that syphilis, or a sore with a hardened base is a very rare thing in the woman; indeed, some surgeons have stated that they have never seen one, and disbelieve in the existence of such a sore; undoubtedly they are rare, but why? Because these sores, in the early part of their course are generally, or almost always, painless; nay, they may actually continue so, even after the secondary symptoms have appeared, and they may heal, leaving only a hardness, which exists for a short time, and then, being combined with what one constantly sees in women, viz. the mucous tubercle, become with difficulty distinguishable from that sore. I have frequently called the attention of my dressers and pupils to the existence of a syphilitic sore, as I use the term, in a woman

who comes to us at the hospital, not having had syphilis on any former occasion.

Surgeons who maintain the opinion that women are not subject to hard sores, of necessity conclude that all sores may be followed by secondary symptoms, denying the existence of any difference in the feel or appearance of sores in the female. And yet that there are two different kinds of sores *in the male* I cannot doubt; nor, I should think, does any one who looks at the subject with an unbiassed mind. But why should not this be true *of the female* also? May there not be a solution of the question in this manner, that owing to the freedom from pain women with syphilis can continue connection, and in the class of prostitutes who form our hospital patients, do continue their business without any inconvenience to themselves? Nay, in many cases I cannot help thinking they are unaware that they are the subjects of such a fearful malady. In by far the larger proportion of the prostitutes who come under my notice in the hospital chancres or painful sores are present with true syphilis, and it is owing to the presence of these chancres that they have been unable to pursue their business, for which reason they apply for admission, and not for the syphilis, for they have been unaware at the time of examination that they had more than the one sore, viz., the tender, soft one, or chancre. Seeing a secondary eruption on them, I have carefully looked for a true syphilitic sore, and have frequently, though I admit not always, found one. I say not always, for if a patient have been the subject of syphilis prior to my examination, and she should appear in hospital with a recurrent form of secondaries, of course no primary sore will exist, and I cannot help thinking this to be another of the reasons why, in women, the sore of a syphilis is not always to be found. I feel convinced that women will get syphilis, have a rose rash which lasts a short time only, feel no inconvenience from their one sore, and only apply for advice after the appearance of the scaly or papular eruption, when all traces of the primary sore have disappeared, and they have obtained a chancre, for which they present themselves. How deceiving all this is must be evident. Again, how difficult it is to obtain the truth from the women who are generally admitted into the Lock Ward no one but those who have had some experience in trying to elicit

facts from them can be aware ; indeed, in the whole catalogue of diseases to which both sexes are liable I know of no one where so many untruths, voluntary or involuntary, are spoken, as in relation to those of the generative organs. For many years I have enjoined my reporters only to note down what they see, as they are pretty sure to be misled by the statements of the women, who will give a different account to reporter, dresser, and surgeon ; and it requires considerable experience to get at the truth by weighing well their statements.

The youngest girls who have been under my care in Patience Ward with syphilis were two, of the ages of 13 and 14 respectively, who were admitted two years ago, each with syphilis, mucous tubercles, and secondaries. This is not the earliest age at which I have seen syphilis and secondaries (I mean, of course, acquired, not inherited, syphilis), but the patients above referred to were the youngest inmates of Patience Ward whom I have had under my care.

Now, a few years hence these girls will most probably deny, or perhaps forget this syphilis, and hence a train of anomalous symptoms may follow any sores they may afterwards contract ; having been once inoculated with syphilis, eruptions of a recurrent form may appear coincidently with chancres, and they may thus be said to have secondaries following chancres, whereas the two are independent diseases.

In men, again, the painlessness of the sore of syphilis is often a cause of their not noticing it. Who has not seen a patient with a primary sore of syphilis, said to have been observed a day or two before for the first time ? And yet one has been perfectly certain, from its size, that many days at least, if not a week or more, must have passed since it first made its appearance ; but so free from pain has it been, that the sore has not even attracted the patient's attention ; if this be the case with the male organ, which can be easily seen and watched for the commencement of any disease, how much more likely is it that this painless sore shall not attract the attention of the female on a part which she cannot see.

The period at which syphilis may occur after connection or imbibition of the poison is a point of some interest ; that it does occur within a week, is undoubted ; that it may also appear

as long as five or six (or perhaps even more), I have also undoubted proof. In several instances a month has elapsed. In these instances the sore has been small and free from hardness, sometimes for a week; of course, also, the secondary symptoms have been delayed, even to three months. Now, it cannot be admitted, I think, that these periods vary so greatly if we suppose that all sores, primary or secondary, are capable of affording the same virulence of poison. I am forced to the conclusion that there are various intensities of the syphilis poison, according as in one case this poison may have been obtained from a typical hard sore, and in another from a mucous tubercle. If such be allowed, we then, I think, have an explanation of some of the difficulties attending the elucidation of many points in regard to syphilis, as, for instance, that the hardness appears in one patient within a fortnight after connection, in another not for a month or even later. Can otherwise the incubation vary so much for the same poison? In both cases the patient has received the poison, but in modified forms. Again, who has not seen cases in which multiple sores that were thought to be soft ones have ulcerated slowly for the first three weeks after infection, and yet at the end of that period, without fresh infection, one of them has assumed the nature of true syphilis. True syphilis is one; but the endless varieties and intensities of the poison are not to be attributed, I believe, to the idiosyncrasies of the recipient, as is so often stated, but to the mode of propagation of the poison. In examining a large number of women with syphilis, one fails frequently to find the true syphilitic hard sore, but almost universally, if the patient be the subject of syphilis, she has mucous tubercles in abundance. I therefore am driven to the conclusion that my explanation is the true one. It must be acknowledged that these mucous tubercles are capable of giving syphilis, though they are, undoubtedly, a secondary form of the disease; but as the sore in the mouth of the syphilitic child will give syphilis to the nurse, so will these mucous tubercles give syphilis to the male, and I believe them to be a most fruitful source of contagion. It may be asked, how do I account for the presence of syphilis so frequently in the female as our Lock Ward shows? I certainly do not believe it arises from any kind of soft sore in the male, or any primary sore that has not more or

less of a hardened base ; and I think it arises more frequently from a secondary manifestation than from a primary sore. I also believe in the possibility of the absorption of the poison of syphilis by a mucous membrane, if there be the slightest abrasion of the surface, without a well-marked hardening necessarily following the wound. There is no contradiction between this and my former statement ; men often do receive syphilis from a primary hard sore, women more frequently from a secondary.

There is an idea amongst the public that sores are very commonly contracted by sitting on dirty water closets, the penis thus coming into contact with the poison ; without denying the possibility of such an occurrence, a statement of this kind would of course be received by every surgeon for what it was worth ; but I think it has been shown that unless there is an abrasion, be it ever so slight, of the skin or mucous membrane, no poison can enter the system. Ricord spoke of the matter of a soft sore being in contact with the vaginal mucous membrane some hours, and then producing a sore. I suppose on the same principle, that any poisonous matter in contact with sound skin or mucous membrane would, in course of time, irritate, and eventually produce a sore ; whether such an effect could be induced by the application of syphilis poison to a sound person's skin, is an experiment that no one would be justified in making, though it has been said to have been done and with a like result as in the case of a soft sore. I can see no difference between the immediate effects in the two cases.

It would be an important matter to a patient, if we could distinguish between syphilis and a chancre, when he presents himself to us soon after he has first observed anything wrong,—a week, for instance, after connection ; but I hold it to be never possible to speak with absolute certainty in reference to this matter. Judging, however, from what I have seen several times, it appears that, in the minds of some surgeons, every sore is syphilis. I could adduce several instances, and more frequently amongst the higher class of patients, where the surgeon, immediately on seeing a sore, has announced that sore to be syphilis, and has immediately had recourse to mercury ; if no secondaries follow all the good result is attributed to the drug, whereas it is quite certain that, mercury or no mercury,

had the sore been a true syphilis, secondaries must have followed. I much fear that, occasionally, there is more than ignorance on the part of the surgeon ; I would not wish to be uncharitable, but I can hardly imagine how some who I should suppose must have known better can have assured their patients that the drug that had been used had prevented the after consequences of syphilis. I have repeatedly been told of this or I should not thus dwell upon it. I believe it to be our duty to confess to our patients, in the first instance, our utter inability to tell them whether the sores or sore are local sores or syphilis, and if it or they be unfortunately true syphilis, that the poison is imbibed the moment of connection, and that nothing can avail them in warding off its results. I always explain to any who inquire about the matter, that the poison of syphilis is like the vaccine virus, the moment it enters the system, by whatever means applied, it then and there immediately begins to affect the body. In the case of the vaccine poison—in this instance I will call it a poison—it shows its effects more rapidly than in the case of syphilis, but it is not the less certain to produce its results ; the one follows as inevitably as the other, and with as much certainty. I must confess to viewing with great distrust the tables systematically drawn up by various authors of the differences between syphilis and the soft sore. These differences, it is true, are admirably given, and in a large proportion of cases no doubt they exist ; but how frequently,—and just in those exceptional cases in which we wish to be most positive,—does a well-marked suppurating and ulcerating sore, after two or three weeks, take on a decidedly hard character, and become followed in due time by a secondary eruption ? I confess to have myself made mistakes on the point in the earlier stages of the disease, and I have seen patients of other medical men by whom similar erroneous judgments had been given.

In cases of syphilis, when the sore is on the generative organs, there is generally more or less enlargement of the glands in the groin, and this enlargement is looked upon as pathognomonic of constitutional poisoning, and so it almost always is, but the symptom must not be taken as an universal indication. I have examined several men who have never had syphilis, but who have been much exposed to irritation on the

buttocks from rowing, &c., and such men have always more or less enlargement of the glands in the inguinal region, not, it is true, quite so typical as in the earlier stage of syphilis, but still sufficiently so to attract attention; but supposing the enlargement to be seen in the cervical and axillary regions also, the diagnosis becomes perfect. After a short time this enlargement disappears. It is important that the fact of enlargement not always occurring should be borne in mind, as I heard Mr. Lee, a surgeon of eminence in this matter, state that because no enlarged glands could be found in the groin of a patient seven months after he was said to have communicated syphilis, he could not have been the subject of the disease. That it is by no means constant I am sure; and even when it occurs I doubt very much whether it is always owing to the poison, though no doubt it generally is so.

The time at which the secondary eruption first appears is a point which the female venereal ward at Guy's Hospital can scarcely give one the opportunity of determining; it is only by carefully watching a large number of private cases that one has the means of accurately stating the time.

A large proportion of the patients in our Lock ward are the subjects of secondary syphilis, in some shape or other, at the time of their admission. It is true there must have been a time when they received their first inoculation; but if the reader will bear in mind what I have already stated in the earlier parts of this paper, he will see that we are very unlikely to have an opportunity of observing a case under such circumstances, since syphilitic sores in women are unattended with pain, and they therefore seldom come into the hospital on account of their being affected with these sores. I, therefore, have given up all hope in the Hospital of arriving at a satisfactory solution of this question, nor does it appear a matter of much consequence. It is more a matter of interest, than of any practical advantage, to know how long an interval may be expected to elapse before a patient will become covered with the external evidence of syphilis.

At the period when a secondary eruption may be generally expected the character of the sore itself shows that an eruption must come sooner or later; it may be postponed, it may arrive early. My private cases give me, as an average, seven or eight

weeks from connection to the time of the eruption first appearing, though some authors give a longer period, extending to nearly three months. Undoubtedly exceptional cases do occur of the postponement of the skin manifestations to that period, but I think they *are* exceptional, at least I know they have been so in my practice; I have not four cases in which they have been postponed longer than three months.

Amongst the various forms of secondary eruption that have occurred in the patients I have had under my care in the Lock ward, by far the most common is the scaly; the macular is next in frequency; the papular, which is about as common as the scaly, and, lastly, the tubercular, with rupia and ecthyma. This does not at all coincide with my private cases, where a roseola is by far the most common; but in enumerating these eruptions in their order, I must not omit to say that mucous tubercles accompany each and all of them, and are an almost constant attendant, being described by the woman as piles whenever they occur in considerable abundance about the anus and the lower part of the labia. These mucous tubercles are generally far more frequent in women than in men, though on board the "Dreadnought" the sailors were particularly subject to them, and I fancied then as the result of beastly habits—I now think of syphilis as well as want of cleanliness.

Almost all the women, whatever other secondary disease they may have, invariably suffer from these "plaques muqueuses," sometimes ulcerating and discharging fluid, at others only red and raised; if in the former condition, they secrete such an offensive matter, and this so quickly becomes decomposed, that the existence of the tubercles can almost invariably be diagnosed by the odour alone. There is scarcely any part of the body where two surfaces of skin come in contact, or where the skin is at all delicate and the secretion from it alkaline, as in the axilla, or where it is altering its character, as at the angles of the mouth, orifice of the meatus auditorius, nose, &c., where these mucous tubercles may not be seen. There was lately a woman under my care with one at the outer canthus of the eye, just where the skin was becoming mucous membrane.

In many cases the secondary eruption is accompanied with an ulcerated and fissured tubercle about the anus, sensitive,

giving rise in some patients to as much pain in defæcation as fissured anus, and in others to no inconvenience whatever. That these ulcerated mucous tubercles are so common in women, as compared with men, I attribute to the facts that the habits of women (in Patience Ward, for instance) are often so dirty, and that the quantity of secretion formed in them is so excessive.

In men they occur around the anus, particularly where the use of soap and water to the part is an exception instead of the rule; but they may and do appear, undoubtedly, in the most cleanly people, and are in them very intractable. The corresponding condition, namely, a raised tubercular mass, is seen at the back of the tongue and at other spots as I have mentioned, where they are constantly arising from other causes than dirt, and consequently must be looked upon as the secondary manifestations of syphilis as a rule; I say as a rule because I believe I have seen them as simply the result of dirt and moisture in some women. I speak rather diffidently upon this question now, since a more extended experience has shown me how rare it is to find any women in our Lock ward who have not had syphilis at some period; but if I doubt that mucous tubercles are always of syphilitic origin, I am immediately confronted with the argument that the patient has inherited syphilis. I very much question the policy of accounting for syphilis that cannot be proved to have been acquired by supposing it to have been inherited, as seems to be the fashion at the present day. I do not for a moment deny that it is largely inherited, still to say that because a person after the age of puberty, and this I particularly dwell upon, cannot be traced to have acquired syphilis—it is his or her own confession that we are relying upon—therefore they must have inherited any syphilitic taint they may have, is, to my mind, a monstrous doctrine; it comes to this, that every young man or woman who, at the age say of 20, cannot be found out by a surgeon to have had acquired syphilis, must, if he or she present any evidence of the poison, have inherited it from his or her parents, or possibly grand-parents. This doctrine opens too vast a field.

I have mentioned as the most uncommon form of skin disease, unless in very severe cases, and in the older patients,

and sometimes even in younger ones who have gone through the various eruptions rather rapidly, rupia. I doubt whether this form of eruption ever occurs, except as a *sequela* of syphilis. That it is closely allied to and sometimes undistinguishable from ecthyma, there can be no doubt; it is usually said to occur at the termination of a syphilitic disease, but it undoubtedly occurs in young people sometimes very rapidly; at least, I have a patient not twenty under my care now who is suffering from a very severe form of rupia, and though female patients may, and undoubtedly do, acquire syphilis very early, the vigour of the constitution usually wards off this form of secondary disease until later in life than twenty. The only explanation I have of this form of eruption appearing early is the very deficient amount of food many of these women have to put up with.

These patients are, however, usually very amenable to treatment, and the eruption rapidly disappears, especially amongst the younger occupants of the ward.

It seems to be the form of disease which is a kind of transition state to what is known as the tertiary manifestation; and here let me explain the distinction that I draw between these two forms of the same disease. I would not do away with the terms—they are convenient. Secondary disease attacks skin and mucous membrane, and if the deeper seated parts, as in rupia, invariably attacking the superficial first and spreading from these to the deeper structures; whereas the tertiary form of disease is typified by a gummy deposit—it attacks skin secondarily, commencing in the subjacent parts, and involving the skin only when the parts from which that skin derives its nourishment have been destroyed. All the diseases to which the other structures of the body are liable from syphilis—and what part is free?—I class as tertiary.

I am, of course, including here acquired syphilis only. Time is no element in my division; a recurrent attack of skin disease is as much a secondary form as the first eruption was, and the fissures and cracks of the tongue, occurring, as they do sometimes, very many years after the poison was first received, are still only secondary manifestations. There is a form of secondary disease by no means uncommon which is very characteristic, viz. ulceration of the skin between and

under the toes, and also about the nails, sometimes excessively troublesome to heal, at all times very painful; so far as my experience goes this occurs more frequently in women than in men, though the number of the patients of the latter class far exceed the former.

I now pass on to the soft sore, or chancre, the one by far the most frequently seen; a mere local affection, at the early stage most amenable to treatment, at any stage perhaps painful, but not disastrous in its consequences unless grievously neglected, even when the patient has herself or himself alone to thank for allowing it to have become large. As I have previously stated, this is the most common sore to be found in our female Lock ward, and it is undoubtedly the one for which alone, in by far the larger number of cases, the women demand admission; it is almost invariably situated at some part of the female organ outside the vagina, rarely, if ever, within the canal, more commonly at the fourchette or at the fold formed by the carunculæ myrtiformes than at any other spot; its painfulness and inflamed condition are, I believe, as I have previously stated, the very causes of the patient coming before us. It is rapidly destructive in its action, and most frequently multiple, and when rapidly ulcerating will extend some short distance up the vagina, but its tendency is undoubtedly to spread outwards and involve the nymphæ, which it quickly destroys. In the older prostitutes one frequently finds either a scar of large size, or destruction of part of one or other of the nymphæ, as evidences of the ravages of this species of sore; indeed after a chancre I should say the evidence of past venereal disease exists far more permanently than after syphilis. I have just stated that these sores are multiple in character; they seem to increase in number in women more rapidly than in men, owing to the excessive moisture and secretion of the generative organs in the former. Thus, if seen on one labium, they are almost sure to be observed also on the opposite, at some spot to which the secretion from the original sore has easily reached; indeed, it always appears to me wonderful how any part of the vulva escapes contamination. The most distinctive sign to be noticed as indicative of the whereabouts of a sore is the almost universal presence of œdema. And if this be local, or in one labium only, there most assuredly will be found a sore in connection

with it as the source of irritation. The natural tendency of this sore seems to be after some weeks to heal spontaneously, but before it does so it may involve the destruction of a vast surface, and sometimes of a considerable depth of tissue. In men it not unfrequently commences about the frænum, progresses rapidly, and lays open the urethra; but I have never yet, in women, seen it extend so far up the vagina as to open the urethra; it has more than once implicated the meatus of the urethra in the women, as it will do in men, and no doubt, in these cases, the constant irritation of the urine proves a source of great difficulty in curing the patient. I have sometimes seen it in men creep into the urethra, and extend as far as can be seen up that canal. Its main character is its soft base, but this is by no means so constant as its name would imply; indeed, not unfrequently, when situated on the prepuce, there is a considerable amount of hardness, so much, indeed, as to give rise to grave doubts on the part of the surgeon whether sooner or later the sore will not be followed by secondaries. This thickening, it is true, may be induced by the applications made to the sore, which have inflamed it, but it is none the less puzzling to the surgeon when called upon to give a decided opinion, as I have before mentioned; and if what I stated in the early part of this paper be correct,—that a sore after three or four weeks of suppurative action, and bearing distinguishing characteristics of a soft sore, may at the end of that time gradually become hard, and put on the usual characters of syphilis,—I can only explain it by the two conditions existing in the woman from whom the poisons have been received,—a very frequent combination in Patience Ward, so far as I have seen. In other words, the man receives two poisons at the same time, the one that of true syphilis, the other a local poison, or that of chancre, and I can imagine nothing more likely from an examination of the women. And this leads me to say a word or two about this chancre poison—what is it? First of all, it must *be* a poison of some description; it invariably so much irritates the parts to which it is applied that in two or three days there are evidences of its effects, sometimes in four or five spots on the penis, at other times in innumerable little pustules; but however severe it may appear, it is simply local in its effect, and has

most certainly been obtained from a sore of the same kind. I cannot believe that it is a degeneration, if I may so describe it, of any form of true syphilis; in other words that the pus obtained by irritating a hard sore will ever, or can ever, produce this poison. I would much rather believe that it can arise *de novo* from a combination of dirt and moisture than that it can be a degenerated syphilis; if it were the latter, indeed, there would be constantly seen modifications of syphilis of all shades and varieties, occasioned by a more or less diluted condition of the poison; whereas such is not the case. If a patient has syphilis it is unmistakeable. There is no deviation from the regularity of the symptoms, at least the variation that does take place is not of sufficient moment as to induce me to believe we have so great a modification of the poison as there would be if this diluting action could be established. I do not think we are called upon to account for the manner in which a poison is first obtained, whether that poison be local or constitutional; suffice it to say the two exist, one acting locally, the other constitutionally. They may be entirely distinct, and are so far as their effects go; but both occurring on the generative organs, they may exist separately or combined.

These are the sores which now and then take a phagedænic action, and rapidly involve all the surrounding parts. This destructive action is most frequently seen in young, delicate, and ill-fed lads and girls. It is by no means a very uncommon occurrence to have in our Lock Ward a young girl about fifteen years of age, half-starved on admission, and with a sloughing sore on one labium rapidly involving all the surrounding parts, extending to the groin, up the vagina, and along the buttocks, now and then penetrating so deeply as, in one instance, to have involved the femoral artery, giving rise to the most fearful excavations, and generally followed by death. The rapid sloughing which takes place appears not to be restrained by any means we can adopt, and the horrible pain these patients suffer is scarcely ever relieved by any application. Upon careful inquiry from these girls I have found that, in two or three instances, they appeared to have lived for many months upon nothing but gin. The same condition may exist, but not to so horrible an extent, in the male, involving the entire penis; in one case I saw, the sloughing took place and involved the

dorsal artery of the penis so repeatedly that death was the result of the hæmorrhage, combined with the miserable condition in which the patient was, the result of debauchery. The loss of treble the quantity of blood might easily have been borne by a patient in fair health at the commencement of an illness. These sloughing cases are certainly rare, but the records of all hospitals must contain some such accounts; they are undoubtedly less frequently seen now than in my pupil days, twenty-five years ago, or else when they appear are more manageable; but one or two cases that I have had under my care in Patience Ward can scarcely have been less severe than what was known at Guy's Hospital thirty-five years ago as the "Swan Alley Pox," from the virulence of the disease contracted amongst the sailor population occurring in women inhabiting the lowest haunts of Swan Alley, and living upon spirits continually. There are, of course, numerous less severe conditions of this malady, but in all cases the destruction of the soft parts goes on with more or less rapidity, and demands somewhat active treatment, owing to the looseness of the tissues involved, and the consequent rapid infiltration of serum with which they become imbued, and the as rapid sloughing which necessarily takes place. These sores are never seen as the result of true syphilis, but only of the chancre or soft variety; the same sloughing may occur to open bubo, for when a bubo forms in a patient with chancre or soft sore, suppuration takes place in a large proportion of cases—a proportion very much larger than in syphilis, where it rarely occurs; indeed it is quite an exceptional thing for a man or woman with true syphilis to get a suppurating bubo. If a patient tells me, in giving a history of his case, that he had syphilis and an open bubo, I am slow to believe in the existence of the true syphilis, and suppose rather that he has been the subject only of a chancre or harmless sore.

I will now offer a few observations as to the treatment I usually adopt, first, in a case of syphilis, or hard sore, and, secondly, in one of chancre, or a soft sore.

In speaking of the treatment of the sore of syphilis one has to deal with it in its several stages—firstly, when it is not a typical sore, but suspicious, a mere abrasion; again, when it is well marked; and again, when it is combined with a chancre,

or when it takes the form of a soft sore or chancre, becoming indurated.

In all sores when first seen, no matter of what kind, provided there is no marked hardness, I invariably destroy the surface with strong nitric acid carefully applied, frequently under the influence of chloroform, and then with the nitrate of silver rubbed in upon the destroyed surface. This latter application has usually a peculiar power of relieving the pain occasioned by the acid; if in the course of five or six days, the slough having separated, there is not a decidedly healthy action in the sore, I again apply the acid, after both applications dressing the part with wet lint. Great care must be used to apply the acid fully to each sore, or any one to which it is not applied quickly will again affect the ones that have been destroyed (provided there are more than one). I believe in all sores appearing a few days after a suspicious connection this is the plan of treatment that should be adopted. Supposing the sore to be true syphilis, or about to become hard, no harm is done; and if it be a chancre or local soft sore only, it most assuredly will be thus destroyed, and a healthy granulating surface will arise, which will quickly heal. To the women in Patience Ward this application is sometimes made in a thorough manner with great difficulty, owing to the folds about the generative organs, and hence the necessity of always applying the escharotic in their cases whilst they are under the influence of chloroform. I have several times, when the sore has been isolated, and when, consequently, I have suspected its true syphilitic character, removed the sore and a considerable portion of the surrounding tissue completely, including the semi-hardened portion, and in all cases, without exception, even where there has not been the slightest other evidence of syphilis poisoning, have found the sore return on the excised spot. These experiments were made by me many years ago, and I was then brought to the opinion I have before expressed, that the moment of connection is the moment of the reception of the poison. So stretched is the delicate skin covering the penis in a state of erection, and so acutely sensitive does it become in the state of orgasm, that if a poison exist it is doubtless absorbed and taken up by the system immediately the organ comes into contact with the poison. In the female, particularly in the older pro-

stitute, local manifestations of disease are rarer, and we seldom have to apply our remedies to their external organs, owing to the absence of that extreme delicateness and susceptibility to impressions observed in the younger women. If I am called upon to see a sore that has existed some weeks, presenting the typical manifestation of hardness, and particularly if there exist any enlarged glands in the groin, I consider the application of an escharotic to the sore useless; I generally, under these circumstances, order small doses of mercury at once, either by fumigation, by inunction, or internally in the shape of Pil. Hyd. Should, however, there be the slightest doubt in my mind of the true syphilitic character of the sore, I defer the remedy until the eruption appears, believing that I should do but little good by hastening its adoption. The good effects of mercury no one but those who wilfully shut their eyes to the beneficial effect of a therapeutic agent can doubt; that it cures the disease I do not believe, that it expedites the time of the patient's recovery I have not the smallest doubt. The inmates of our female ward, looking sallow, pale, and dejected upon their admission, frequently become fat, round and well looking after the use of the remedy for six weeks or two months. "Ah!" Dr. Drysdale and his fellow-thinkers might perhaps say, "the good and regular living of the hospital has conduced to this, not the poisonous drug with which they have been saturated; they have got into good condition in spite of, not in consequence of, the remedy." But if the same result happens (as it has happened) scores of times, I can come to but one conclusion;—of this I am fully convinced, that though patients may be and are treated without mercury, and get well without the drug, the period that elapses before their recovery is immeasurably greater in their cases than when the drug is carefully administered. I have seen patients who have been under the care of non-mercurialists tired with the length of time that they have been going on with the eruption still upon them, and the hardness of the sore still continuing, and they have asked me if some remedy could not be used to hasten their cure. Any other remedy than mercury for the treatment of the hard sore and the earlier rashes I consider to be useless; and, indeed, if there is but a faint stain of the skin, and but little hardness of the sore, I do not give any medicine what-

ever, and wait until there is a further manifestation of the poison in the shape of a papular or scaly eruption ; and here let me observe that the same patient frequently exhibits various forms of skin disease at the same time, in one part a scaly eruption, in another a simple stain, and in a third a papular rash ; in these cases I should administer mercury at once.

I suppose that other surgeons must have noticed the much less frequency with which women complain of a soreness of the throat than men ; I have observed this over and over again, and I can only account for it by supposing that the influence of tobacco, either chewed or smoked, on the tonsils and fauces causes the greater irritation in the latter class of patients ; there does not appear to me any other reason for the difference, and that it is pretty constant I think those who have had much experience in the treatment of syphilis in the two sexes must have observed. I seldom find that men complain so much of their throat after they have left off smoking, and removed the irritation occasioned by the tobacco.

In the pustular forms of syphilitic skin diseases, such as ecthyma and rupia, a grave question sometimes arises as to the propriety of administering mercury ; there is no doubt that, in some cases, the patients are much benefited by a careful administration of the remedy. I have no faith in improving the general health, as it is called, previous to the exhibition of the drug. The patient appears to me to be suffering from the effects of the syphilis, and if that can be benefited by good diet, &c., there is no necessity for mercury ; but if, as we often see, the patient continues cachectic and ill, with an increase in the size and number of the sores, despite the good feeding, then I have frequently given mercury with the most marked benefit. But, as a rule, it is undoubtedly not applicable. And here, for the first time in the treatment of syphilis, that invaluable drug iodide of potassium comes to our aid ; for many years now it has filled up the gap just where a something was wanted in the treatment of syphilis, but to get the good effects of the remedy the doses, I believe, must be large. I have now for the last twelve or fourteen years given iodide of potassium in these cases of rupia, as in all forms of so-called tertiary syphilis, in doses of from ten grains to two scruples three and four times a day, with the

greatest advantage. Many of my former pupils can, I am sure, call to mind what they considered my heroic doses of this drug. In advanced secondary or tertiary forms of this disease, I generally begin with the smaller dose, and if a decided effect is not produced upon the disease in the course of a few days I quickly increase it until I achieve what I know the drug will do, that is, induce a healing action in all spreading sores. Indeed, I may here mention that in some of the old-standing cases of tertiary syphilis I recommend the patients to use this salt with their food instead of common salt, and with great advantage. Whenever, indeed, patients are the subjects of what are known as "the gummy products" of syphilis, or with the so-called "cancer of the *face*"—a part of the body this tertiary form of the disease seems particularly to like—they are most quickly cured by the use of this drug; and if they are not quickly treated with it the most frightful deformity is left. Patients have just cause to blame their surgeons if they overlook this condition.

As regards the treatment of the soft sore or chancre, my rule is, and I feel more and more convinced of the propriety of the practice, to destroy the surface and obtain a healthy sore. To the student or young practitioner, I would say,—If you find that one application is not sufficient, do it again; and if a second does not answer, apply the acid a third time. But if the first application be made whilst the patient is under the influence of chloroform, even when the sore has attained a large size, the second is rarely required; or, if a second should be required, a third is still more rarely necessary. If patients are seen within the first week of infection two applications of nitric acid are never necessary, but unfortunately the women in Patience Ward rarely or never present themselves so early as the first week, unless the sore has become much inflamed and irritated, either by neglect, bad living, or the most frequent source of irritation, viz. too frequent connection; in these instances they frequently apply for advice early, the sore or sores having become so irritated that further connection has been rendered impossible without extreme suffering. Under these circumstances a poultice is always applied over the vulva, and the patient kept in bed a day or two before any remedy is used. In some women, owing to the size of

the soft sore or chancre when first seen, it becomes practically almost impossible to employ an escharotic to destroy its surface; in these cases, and sometimes in men who object to have the sore destroyed, or where the sore is situated so closely over the urethra as to threaten the laying open of that canal, I do not think it advisable to apply nitric acid. A lotion composed of Ferrum Tartaratum and Extract of Opium is a very good remedy, and one I use largely, but it has the disadvantage of staining linen, and, consequently, like nitrate of silver, must be used carefully. Sores seem to be benefited by this application when they are disposed to spread and are painful, but, as I have before observed, the natural tendency of this, as all other diseases of the human body, is to get well, and it is sometimes difficult to give the credit where it is deserved. Certainly in the cases of prostitutes I look upon the rest which the generative organs obtain from a residence in the hospital as one of the most potent remedies for severe chancres, and believe that to it they are indebted for the rapid healing of the sores; in many cases more is undoubtedly owing to this than to the lotion ordered. Rest in the recumbent posture in the male is unquestionably a very useful addition to our other treatment of chancres. In all cases of these sores, whether in females or males, I give iron internally, generally with quinine, or alone in the shape of pill, and with the happiest results. In speaking of the treatment of a chancre or soft sore I have mentioned the necessity of destroying the surface with nitric acid; but if the sore refuses to heal I generally suspect that there is a taint of syphilis, which, at the end of three or four weeks, makes itself manifest by a hardening of the sore. In these cases I may have applied the escharotic twice or three times even before the hardness has become marked; but immediately that condition becomes distinct I discontinue the further application, and leave the patient to apply some cold water until the true character of the sore has been revealed; for be it observed, in these cases the hardness may be the result of the application, and it is exceedingly difficult to judge at first to which it is owing,—to the syphilitic poison or to inflammation around the sore set up by the irritation. Time soon proves.

I am aware some surgeons never destroy soft sores or chancres at all, considering they do as well with treatment by lotion,

I have several times had women in Patience Ward ask me to allow them to have their sores burnt again, as they call it, in consequence of the great relief they have experienced to the gnawing pain usually felt in chancres when eroding the surface and rapidly ulcerating. Indeed, I look upon this as the best evidence which can be offered of the value of the plan I have recommended. In the buboes that result from the supuration of the glands in the groin, or of the cellular tissue around the glands—for either may occur if the sore does not quickly put on a healthy appearance—I have destroyed the surface with nitric acid, as I believe the spreading sore here is to be considered identical with the original sore on the penis, and requires, therefore, the same treatment. On the value of chloroform I need hardly insist, when so large a surface has to be dressed.

Regarding the treatment to be adopted for the phagedænic sores to which I have alluded in both male and female patients, the practice of destroying them with powerful escharotics (or even with the hot iron, as recommended in some instances) is, I hold, useless, and worse than useless, as tending only to the spreading of the sore. I have applied nitric acid with the most liberal hand and have found it no check to the rapidly destructive action; nay, I have thought in some instances I have rather increased the fearful pain of the malady and accelerated its progress. During the last few years I have trusted entirely to opium and iron given internally in no sparing doses, and to the use of opium externally to the sores, with a most scrupulous attention to cleanliness; indeed, I am not at all sure that a careful nurse, one who keeps these patients in a state of as perfect cleanliness as is possible, has not more than our remedies to do with the beneficial result that sometimes happens. By careful nursing I mean, not only cleanliness of the sore, but also thorough and frequent administration of nourishment, with a moderate amount of stimulants. The powers of nature are immense, and unless the patient is too young to rally, or has neglected to apply until too long, one's attempts are not unfrequently crowned with success; but what a cicatrix is left—bands of cicatricial tissue, with loss of the labia in the female, or with destruction of a considerable portion of the penis in the male.

DEFINITIONS

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PHYSIOLOGY OF BINOCULAR VISION.

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BY ALBERT M. WINE

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SECTION IX

Continuation upon the Elements of the Innominate Visual Plane, with Remarks upon the Experiments of Exalt Hering.

THAT the visual organs, whether considered with reference to their form, their relation to each other or to the external field, exhibit the most perfect congruity, cannot, we should imagine, by the intelligent observer be for one moment doubted. It must, however, be admitted that to the superficial glance this phase of the subject is not the most apparent. Still, that such is the fact is, we think, sufficiently demonstrable, nor do we hesitate to affirm that any theory of vision, failing to recognise the conditions subject to which the images are received upon the two retinae, must eventually prove abortive; and the more closely we observe the form and position of the eyes, their relation to each other, and also to the different sections of the external field, the more we are convinced will the perfect congruence of existing arrangements impress itself upon the mind. So great, indeed, is the importance we attach to these considerations (elementary though they be) that our attention in two previous sections has been specially directed to this part of the subject, nor has the course we have adopted proved barren of results. It has been shown that the

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limitation of the temporal field is secured by means of the nose acting as a septum, placed intermediate between the two eyes, and also that the extension of the nasal field is consequent upon the fissure existing at the junction of the arch of the orbit with the cheek bone, thus connecting two important results, namely, the limitation of the temporal field and the extension of the nasal field¹ with the position of the eyes, considered in their relation to contiguous structures. *And in pursuance of the same course of inquiry, we would now direct attention to another point, which, if we mistake not, will be found to involve considerations of fundamental importance.*

We cannot advance one step in our inquiries respecting the phenomena of binocular vision without observing that the eyes are placed at some distance from each other, and thus, at the first glance, the great difficulty of the subject presents itself to our notice ; for what, we would inquire, but the distance between the two eyes renders the problem of binocular vision so difficult of solution ? Were there but one central eye the phenomena of vision would rank with the phenomena of the other senses, and there would then be no special difficulty with reference to the function of vision ; but the eyes, we remark (measuring from the centres of the pupils), are placed from two and a quarter to three inches distant from each other. It follows, therefore, that the pictures received upon the two retinae are obtained from distinct points of view. How, then, or under what circumstances, do the two pictures, obtained from different points of view, appear as one picture—or how are they apparently seen as from one point of view ? This is the great problem of binocular vision. Philosophers have, it is true, attempted to solve this problem by assuming that the visual direction is the same as that of light direction ; but this conclusion at best was hypothetical, and recent investigations have *proved* the hypothesis to be erroneous.² What, then, we repeat, but the distance between the two eyes renders the problem of binocular vision so difficult of solution ? And, slightly modified, this query may suggest another. The eyes, we have remarked, are placed from two and a quarter to three inches distant from each other, and *in the external field there is a space correspond-*

¹ See 'Guy's Hospital Reports,' vol. xiv, p. 55.

² Ibid., vol. xii, p. 290.

ing with the distance between the two eyes. Now, to discern that all objects within this region of the external field are placed in a peculiar relation to the visual organs needs, we think, no great force of observation. And thus are we led to the purport of our present communication, namely, an inquiry into the nature of the visual phenomena connected with that space in the external field corresponding with the space between the two eyes. This region we designate *the Transverse visual plane* ; and it would, we think, be difficult to suggest a problem more vital to our subject than that included in the inquiry now proposed for our consideration ; nor is it other than remarkable that the phenomena connected with the transverse visual plane should not long since have received the fullest investigation. We are not aware, however, that such has been the case ; and, if we may judge from experiments as they are usually conducted, and from other indications not less significant, the phenomena now proposed for investigation have, so far as relates to any consistent or practical solution, remained unrecognised. This circumstance was alluded to in our last section, where it was stated that experiments relating to binocular vision, when conducted without recognition of the *exceptional* qualities connected with the space between the so-called visual lines, must lead to erroneous conclusions.

It is now proposed to submit this question to a somewhat more critical examination, and we intend to illustrate our observations by applying them to the experiments of Ewald Hering.

With every desire, then, to approach this part of the subject with that consideration to which the author of these experiments is undoubtedly entitled, we still think that the phenomena to be observed within the transverse visual plane have, by Ewald Hering, been misread ; and having ourselves devoted much time to the investigation of these phenomena, and being also impressed with their paramount importance, we shall hope to be excused if, in pursuing our investigations, we exhibit that persistence, which may be allowed to every inquirer after scientific truth. The well-known experiments of Ewald Hering have formed the basis of a new theory of vision ; and these experiments have doubtless gained additional notoriety from the

prominence recently accorded to them by Professor Helmholtz, who, in his work on 'Physiological Optics,' although differing from Ewald Hering with reference to the philosophy of vision, still selects for criticism the theory of Hering, regarding it as the most consistent form which the theory of identical points has yet received.

We will presently define more accurately that section of the external field to which, on the present occasion, it is proposed to direct our special attention. But that we may obtain a better idea of the circumstances connected with this region, let it be remembered that there are two conditions of vision, both natural, but one more usual than the other. For example, when we direct our eyes to a remote object the axes of the eyes are parallel, but when we direct our eyes to a near object their axes are converged. The remarks we are about to make will, for the most part, apply equally to both these states, that is, whether the optic axes be converged or parallel. We shall, however, direct our attention more particularly to the latter condition, namely, that of convergence, and we are led to do so because this condition will apply more directly to the experiments of Ewald Hering.

The transverse visual plane is that section of the external field which corresponds with the space between the two eyes, and the phenomena which form the subject of our present inquiries are connected with the space included within the so-called visual lines. These lines (the eyes being converged) may be described as two lines passing from the centres of the two pupils, and intersecting at the point upon which the eyes are converged; or if the optic axes be parallel, as when viewing a distant object, the visual lines must then be described as *two parallel* lines, passing each line respectively from the centre of the corresponding pupil and extending into space. We wish it to be remarked that under either condition, that is, whether the optic axes be converged or parallel, the phenomena to which we shall hereafter have occasion to refer *are special to the space included within the so-called visual lines*. Before we proceed with our inquiries, it is desirable that we should first ascertain the precise relation of the transverse visual plane to the two retinæ; we shall then be prepared to determine to which parts of the retinæ the images of objects placed within this region

are referred. We will suppose the eyes to be directed immediately forwards, the optic axes parallel, and the eyeballs so placed that their horizontal meridians agree. Under these circumstances two vertical planes, the distance between these two planes being equal to the distance between the axes of the two retinæ, will cut each retina into halves; the two nasal halves will form the inner sections, and the two temporal halves will form the outer sections. Now, if we imagine the two nasal or inner sections of the retinæ to be withdrawn, leaving the temporal sections, each half respectively, to the outer side of its corresponding vertical plane, we arrive at the precise relation of the region under notice with reference to the great tracts of the retinæ, and it becomes evident that the imaginary plane of the right side will form the right boundary, and that of the left side the left boundary of the transverse visual plane, each boundary respectively having the corresponding *temporal* half of the retina to its outer side.

It may be observed that we have supposed the two nasal halves of the retinæ to be withdrawn, leaving only the temporal halves in their relation to the transverse visual plane. It should be stated that we are justified in assuming such an arrangement; since the visual direction of the nasal halves of the retinæ is outwards, laterally, and *away* from the median line, *each half respectively towards its own side of the field*. It follows, therefore, that the images of objects placed *in the transverse visual plane cannot be referred to the nasal halves of the retinæ*; and, further, if we divide the transverse visual plane into halves, by a line drawn from the root of the nose and in the direction of the median plane of the head, it will be found *that all objects placed on the right side of the median line will be referred to the temporal half of the left retina, while those placed on the left side of the median line will be referred to the temporal half of the right retina*. It is, then, quite demonstrable that the images of all objects placed within the so-called visual lines must, under the circumstances described, fall exclusively upon the temporal halves of the retinæ.

We have next to ascertain the visible direction of these tracts—in other words, the direction in which the temporal halves of the retinæ refer their respective images; and it will be found that all images falling upon the right temporal half

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are referred to the left side of the field, while those of the left temporal half are referred to the right side of the field.

Having defined the boundaries of the transverse visual plane, and described its relation to the great tracts of the retinae, we are prepared to enter upon the task we have undertaken, namely, to exhibit some of the *exceptional* qualities which belong to this section of the external field ; and we have also to justify the statement contained in our last section, namely, that experiments conducted without recognition of the exceptional qualities connected with the space included within the so-called visual lines must lead to erroneous conclusions. It is proposed to illustrate these views by reference to the experiments of Hering, and for the present purpose we limit our observations to a single example, which may be found in a memoir published by him in 1861 ; in this memoir the experiment to which we refer is figured at page 35. It should be further stated that the subject proposed by Hering for illustration is the identity of visual direction,—his theory that of identical points ; *and we would have it observed that, for the term identical points, as employed by Müller, Hering substitutes that of covering points.*

We have, we confess, learned to regard with some watchfulness any change of terms, unless, indeed, there be for such change an adequate and consistent reason. It will not, then, we hope, exceed the limits of our legitimate purpose, if we briefly allude to the use, or rather the misuse, of terms as they have sometimes been employed, and especially so with reference to the question at present under notice. Now, Müller is the great authority on the subject of identical points, and the theory advanced by him was very widely accepted, and for a considerable period continued to form the starting-point for all further investigation, until it was thought that the conclusions arrived at by Müller had been disturbed by the revelations of the stereoscope ; an idea which could only have originated in a mistaken view of the subject, since the stereoscopic result, *so far as that result simulates natural vision*, is wholly dependent upon the primary conditions of the theory of Müller having in the arrangements of the stereoscope been complied with, namely, that corresponding pictures should fall upon corresponding halves of the retinae. Still, there are some who, apparently unwilling to relinquish the theory of identical

points, have, from the commencement of the stereoscopic period up to the present time, attempted (*impossible though it be*) to reconcile the stereoscopic theory with that of identical points; and in connection with these circumstances it is that we trace a noteworthy confusion of terms.

To analyse, discriminate, and judge, is not the work of every mind, and it does sometimes so happen that a well-selected term will achieve the purpose of investigation, thought, and judgment. We state, then, that in connection with this part of our subject there has arisen some confusion of terms. For example, the word symmetrical we have seen employed as though it were synonymous with identical, while the term "identical points" has by some been supplanted by that of "*corresponding places*," and we are now, by Hering, required to accept another term, namely, "covering points," in substitution for that of identical points. To this substitution it is that our immediate attention must be directed; and since it is essential to a clear comprehension of any subject, that the significance of the terms employed should be clearly defined, it becomes desirable before we proceed further that we should compare the covering points of Hering with the identical points of Müller, that we may determine how far the one term may be accepted in exchange for the other term. Happily there can be no difficulty in arriving at the precise meaning attached by Müller to the term "identical points," and we give it in the author's words (the italics being our own). "We may," he writes,¹ "regard the spheres of the two retinae as lying one over the other, as in the lower figure, *so that the left portion of one eye lies over the identical left portion of the other eye, the right portion of one eye over the right portion of the other eye, with which it is identical.*" "This experiment leads at once to the conviction that *the parts of the retina which correspond exactly in situation are also completely identical in sensation.* Parts of the retina which lie in the same segments of the sphere, in the same meridian and the same parallel of latitude, the middle point of the retina being regarded as the pole, or which lie at equal distances in the same direction from the centre of the retina, are completely identical. *All other parts of the retina are non-identical, and when they*

¹ Müller's 'Physiology,' vol. ii, page 1194; Dr. Baly's Translation.

are excited to action the effect is the same as if the impressions were made on different parts of the same retina."

If we observe the precise elements which are required to constitute the identical points of Müller, we may note that by him the images are supposed to fall *symmetrically* upon the two eyes, so that they have the same relations to the poles, and also to the meridians of the retinae. It will also be observed, that it is a condition vital to the theory of Müller, that *similar* images shall fall upon *corresponding* sides of the two retinae; and let it be further remarked, that the corresponding sections of the retinae are, by Müller, regarded as being *identical both in direction and also in sensation*, qualities which he distinctly affirms *do not belong to non-corresponding sections of the retinae*; on the contrary, non-corresponding sections of the retinae are by this observer said to be *distinct*, in their directions and also in their sensations; and these qualities, both positive and negative, the former connected with corresponding, the latter with non-corresponding sections of the retinae, have, by more recent investigations, been *proved* by actual experiments, and placed upon a firmer base than was anticipated by Müller himself.¹ Evidently, then, the term identical points, as employed by Müller, implies symmetrical impressions, with similar images upon corresponding sides of the two retinae, and also identity both in *direction* and in *sensation* between those sections of the retinae which act in concert, while the converse of these properties is by Müller assigned to non-corresponding sections of the retinae; *and how incompatible these conditions of Müller are with the theory and experiments of Hering will, we think, under a very slight and general analysis, become evident.*

If now we turn to the theory of Hering, the theory of "covering points," it will become apparent that *all* the fundamental properties of the identical points of Müller, excepting one,² are in the theory and also in the experiments of Hering wholly ignored. In the theory of identical points, as above enunciated, it is required that the images should fall *symmetrically* upon the two retinae; in the theory of covering

¹ See 'Guy's Hospital Reports,' vol. ix, p. 122.

² This point, which for the present we leave, has reference to identity of direction, and for its proof we must look to the experiments of Hering.

points, the images are supposed to fall upon *non-symmetrical* parts of the two retinæ. It is a condition *vital* to the theory of identical points, that the images should fall upon *corresponding* sections of the two retinæ, while the so-called covering points of Hering are supposed to exist upon the two *temporal* halves of the retinæ; these sections of the retinæ are *non-corresponding*, and they are *perfectly distinct*, both in *sensation* and also in *direction*. Clearly, therefore, *and we would have this distinctly understood, the covering points of Hering are essentially different from the identical points of Müller.*

The experiment we have selected for our illustration consists in viewing a thin rod or thread, this rod or thread being placed before the eyes in a direction agreeing with the median plane of the head, and viewed first with the eyes converged upon its *distant* end. *This experiment lies at the very base of Hering's theory, and we may at once perceive that it furnishes a perfect example of those experiments with reference to which we have stated that, if conducted without recognition of the exceptional qualities connected with the transverse visual plane, erroneous conclusions must be the result; and were we required to state the grounds on which we apply the term exceptional to the transverse visual plane, our reply would be, because the conditions of vision, as also the results of vision, connected with this region, are without their parallel in any other portion of the external field.* The transverse visual plane we have described as being covered (if so we may speak) by the temporal halves of the retinæ, it becomes then at once apparent *that the transverse visual plane, unlike every other portion of the visual field, is exclusively temporal*, and the visible directions of these two halves of the retinæ are opposed to each other, the images of the right temporal being referred to the left side of the field, and those of the left temporal being referred to the right side of the field.

We may now direct our attention to the experiment of Hering, with a view to ascertaining how far the results obtained appear to agree with, or to confirm, the conclusions at which he has arrived.

This experiment, as already stated, consists in presenting to the eyes, in the direction of the median plane of the head, a thin rod or thread, and it is required that this rod or thread

should be viewed first with the eyes converged upon its distant end *b*, and subsequently with the eyes converged upon the more central point *c*. Plate I, fig. 1, represents the rod placed in the direction above described, the eyes being converged upon its distant end. For the second observation, it is required that the eyes should be converged upon point *c*. These are the conditions subject to which, as instructed by Hering, our observations are to be conducted. Before we describe the experiments we are about to adduce in illustration of the phenomena on which Hering has based his theory, it should be stated that in these experiments we introduce, in connection with those points to which Hering specially directs attention, the "*lines of light direction*."¹ These lines, it will be understood, represent the direction of the rays of light in their passage from the point viewed to its image upon the retina, so that when viewing the field thus prepared it is as though we could see the visual rays; and we may state that, while the introduction of these lines in no degree affects the validity of the experiments, they add greatly to the clearness of the results.

For each of these experiments we require a piece of flat board, of convenient width and length; the board is to be covered with white paper, and at the proximate end there is to be a notch or hollow to admit the nose. The board being thus prepared, and the point of convergence fixed at eight inches, we draw, in the direction of the median plane of the head, a rather thick line to represent the rod as described by Hering; we then add the two visual lines (the lines of light direction), that is, we draw in two lines passing from the point of convergence, and extending to the proximate end of the board, in a direction each line respectively towards the centre of the corresponding pupil. Point *c* we also in like manner connect with the two retinae, by means of the lines of light direction; the line of the right side is marked *R*, that of the left side is marked *L* (see Plate I, fig. 1). The board thus prepared is to be placed upon the bridge of the nose, and for the first observation the field is to be viewed with the eyes steadily converged upon point *b* (see result, Plate I, fig. 2, where it may be seen that, viewed as directed, the two visual lines are referred in a direction agreeing with the median plane of the head, and

¹ This term was first introduced, and has been admirably applied, by Hering.

that they appear as one line). An image of the rod, *a, b*, is referred to the temporal halves of both retinae, and the rod is seen double, that is, seen by each eye separately; the image of the right eye is referred in the direction of the left visual line, and the image of the left eye is referred in the direction of the right visual line. The lines R and L are seen in reverse positions, the line R of the right side apparently crossing transversely the left side of the field, and the line L of the left side apparently crossing transversely the right side of the field. The line R of the right side being seen by the right eye, and the line L of the left side by the left eye, if the right eye be closed the left half of the field vanishes, and if the left eye be closed the right half of the field vanishes. For the second observation we insert a pin at point *c*, and view the field with the eyes converged upon this pin. Thus viewed, the visual lines (which, as presented to the eyes, converge to a point in the direction of the median plane of the head) are seen as two parallel lines. The space between the visual lines, as presented to the eyes, agrees with the distance between the two pupils; but the space between the visual images of these lines appears considerably narrowed. The central line or rod is seen double. The eye of the right side refers the image of the rod obliquely across the field, stretching from the proximate end of the right visual line (2) to the distant end of the left visual line (3), while the image of the rod is by the eye of the left side referred obliquely across the field, stretching from the proximate end of the left visual line (3), and extending to the distant end of the right visual line (2). These two images of the rod intersect at the point of convergence (*c*), and form a cross (see result, Plate I, fig. 3). The line 2 . . . 2 forms the nasal boundary of the field of the right eye, and the line 3 . . . 3 forms the nasal boundary of the field of the left eye.

Now, if there be one point more clear than others with reference to the function of vision, it surely is that the two eyes are formed for reciprocal action, while in the above experiment the two eyes are made to act *simultaneously*, but to act as *distinct* and *separate* organs; and in the visual result (as figured Plate I, fig. 3) it may be observed that, under these circumstances, the two fields, that is, the fields of the separate eyes, lie transversely across the common field of vision, the

field of the right eye in a direction transversely from the left to the right, the field of the left eye in a direction transversely from the right to the left. And we note that, under the enforced conditions of this experiment, every object presented to the eyes is seen out of place, while the disintegration of the field is general and complete. And let it be observed, that the objects submitted to view in this experiment consist only of three lines. But we may suppose the field to be filled with objects, the images being, of course, subject to the same displacement and duality as the lines; and these conditions being realised, it would, we think, be difficult to imagine a confusion apparently more lawless, a chaos more complete.

We are now prepared to extend our investigations somewhat further, and we have in so doing a twofold object in view—first, that we may consider the phenomena of the transverse visual plane from a new point of observation, and also that we may exhibit the results connected with the experiments of Hering, in their true relation to other results, to be obtained from the same region of the field, but under conditions more consistent with those of natural vision.

The reader, by referring to Plates I and II, will find a rather extended series of experiments awaiting his attention; we venture, however, to hope for these experiments a patient investigation, since they would appear not merely to cast a new light upon the phenomena to be observed in connection with that *important* region we designate the transverse visual plane, but they also apply with some force to the phenomena of binocular vision more generally considered; and in the phenomena to be observed in these experiments we shall trace one dominating law, the existence of which, so far as we are informed, previous to our seventh section had remained unrecognised; and *this law, it would appear, is closely allied to the great phenomenon of single vision with two eyes.*

We may now proceed with our experiments, and having first noted their results we shall apply them to the facts before us. The first three relate to the visible direction of the visual and median lines, and in the phenomena connected with these lines we discern, or believe ourselves to discern, *a complete alphabet of the subject before us.* For these experiments, as for our

former experiments, we require a piece of flat board covered with white paper; for the first experiment a pin is to be inserted in the direction of the median plane of the head, and at a distance from the eyes of twelve inches; two lines (the visual lines) are to be drawn, passing in a direction from the centres of the two pupils, and intersecting where the pin is inserted (see Plate I, fig. 4). Viewed, as in the former experiments, with the proximate end of the board placed upon the bridge of the nose, and with the eyes steadily converged upon the pin inserted in the direction of the median plane of the head, the apparent result will be a single line passing in a direction from the middle of the forehead (or rather from the root of the nose) to the point of convergence, the resultant line being a combination of the two visual lines (see result, Plate I, fig. 5).

If, under a similar arrangement, we view a line drawn in the direction of the median plane of the head, the median line *o* (Plate I, fig. 5), the eyes being kept steadily converged upon the pin as in the previous experiments, this line will be seen double; the image of the right eye will be referred to the left side of the field, that of the left eye to the right side of the field, the visual result being two lines, these lines passing nearly in the direction of the two visual lines, and intersecting at the point on which the eyes converge (Plate I, fig. 7). On either eye being closed the line of the opposite side is lost, thus proving that the image of the right eye is referred to the left side of the field, and the converse.

For the third experiment it is required that all three lines, namely, the median and the two visual lines, should, under the same arrangement as in the two previous experiments, be simultaneously submitted to view (see Plate I, fig. 8). When viewing the visual lines alone, it was observed that these two lines were referred in a direction agreeing with the median plane of the head (see Plate I, figs. 4, 5). When viewing the median line alone, it was observed that this line was seen double, and that the resultant images appeared slightly more divergent, but nearly in the directions of the two visual lines (Plate I, figs. 6, 7).

Such were the results obtained when viewing first the visual lines, and subsequently the median line, separately. We have now to remark that, when viewing the three lines together, and in

their true relations to each other, the result obtained is an *exact combination of the two former results*, namely, the two visual lines appear as one line, and in the direction of the median plane of the head, while the median line appears as two lines, the images corresponding in their directions with the two visual lines (see Plate I, fig. 9).

We have now before us the results connected with the visible direction of the visual and the median lines, having viewed these lines both separately and in their collective arrangement; *and to the direction which the visual lines apparently assume, we point as to a fact of much significance.*

It has been stated that, viewed as in the foregoing experiments, these lines are seen in a direction agreeing with the median plane of the head, where they appear as one line; and the first and most obvious conclusion to which this phenomenon must lead would appear to be that if the visual lines through their whole length are seen as one line,—apparently springing from the root of the nose, and passing in the direction of the median plane of the head,—*so too must all objects placed in the direction of these lines have the same visible direction as the lines*; but the one idea which for the present we desire to connect with the visual lines, and for which we would beg the special attention of the reader is, *that through their whole length, that is, from the transparent cornea to the point on which the eyes converge, these lines may be considered as representing the axes of the two retinae, each line respectively the axis of the corresponding retina.* We may illustrate our meaning as follows:—If an object placed in the direction of the median plane of the head be viewed with the eyes converged upon it, an image of that object will be referred to the axis of each retina, and the combined or resultant image will be seen in the direction of the median plane of the head, and at a distance from the eyes agreeing with the distance of the object viewed; so, in like manner, if two similar objects be placed, one in the direction of each visual line, and viewed with the eyes converged upon a more distant point, will the images of objects so viewed be referred, that of the right visual line to the axis of the right retina, and that of the left visual line to the axis of the left retina, while the combined or resultant image will be seen in the direction

of the median plane of the head, and at a distance agreeing with the distance of the objects viewed.

We state then that the visual lines through their whole length, extending from the transparent cornea *to the point of convergence, may be considered as representing the axes of the two retinae; and we further state that the visual result is precisely the same, the objects viewed being placed in the direction of the visual lines, and equidistant from the eyes, whether they be viewed with the optic axes converged, or with the optic axes parallel.*

We have next to consider the phenomena connected with that experiment in which the three lines, namely, the median, and the two visual lines, are simultaneously submitted to view. In the result obtained from this experiment we note an additional fact, and one of much import, when viewed in connection with what has gone before. The visual lines, it has been already stated, are referred in a direction agreeing with the median plane of the head; we may now perceive that the objects on either side of the field are seen in their true relation to the visual line of the corresponding eye. We have then two facts before us, and they are nearly allied. One is, that the images of the two visual lines meet in a direction agreeing with the median plane of the head, and appear as one line. This is our first fact; and in the experiment now before us, the other is, that the lateral images, or the images of objects placed on the different sides of the median line, move (if so we may speak) with their corresponding visual line; those on the right side of the median plane of the head with the right visual line, and those of the left side of the median plane of the head with the left visual line. *It is our wish to fix the attention upon this fact;* and with a view to its more complete illustration, we have in the experiment under notice, between the median line and the right visual line, introduced the letters *r, g, h*, and between the median line and the left visual line the letters *A, B, C* (Plate I, fig. 10), and it may in the visual result be observed that the letters *r, g, h*, appear on the left side, and the letters *A, B, C*, on the right side of the median line (see result, Plate I, fig. 11), so that, when considered with reference to their true place in the external field, these figures are transposed; yet, and this is our point, the position

of each group, and of each figure, remains rigidly true, when considered in their relation each group respectively to its corresponding visual line.

The fact then we now wish to maintain, and to which we desire to give prominence, is, that the visual images in the above experiment, notwithstanding their transposition, *retain their true relations to their corresponding visual line*, those of the right side of the field to the right visual line, and those of the left side of the field to the left visual line. We would here recall to remembrance, that when describing the phenomena connected with the visible direction of the visual lines, we made special reference to the fact, that these lines through their whole length represent each line respectively the axis of the corresponding retina; hence it follows (our previous statements being tenable), that the result under notice is the same as though the axes of the two retinæ were brought to the median line, the lateral images retaining their true relation to their respective centres,—that is, to their respective visual lines; *a phenomenon which, under the circumstances described, is equivalent to the superposition of the fields of the two eyes.*

We pass now to the next group of experiments; namely, those which refer to the separate or distinct action of the great tracts of the retinæ, and also to those which are adduced in illustration of the phenomena of binocular vision. The means used are the same as for our previous experiments. The point of convergence we fix at fourteen inches; for our first observation, the visual lines being drawn in, we place on either side of the median line three objects, leaving between each two of these objects a space of about two inches; and, with a view to giving clearness to the result, each object as it becomes more lateral with reference to the median plane of the head, is to be placed somewhat nearer to the eyes. The objects thus arranged are for the first experiment to be connected with the *nasal* halves of both retinæ, by means of lines drawn from the centre of each object, and passing to the *nasal* side of the corresponding retina (see Plate II, fig. 1). These lines indicate the direction of the rays of light, in their transit from the object viewed to the part of the retina to which its image is referred.

The proximate end of the board is to be placed upon the bridge of the nose, and the field is to be viewed with the eyes converged upon the pin, inserted at the intersection of the visual lines. The visual result is a number of straight lines apparently issuing from the upper part of the nose, and passing each line to its corresponding object in the external field. The visual lines appear as one line in the direction of the median plane of the head, with a group of lines on either side; the central line of this group is binocular, and results from the combination of the two visual lines; while those lines which form the lateral groups, are monocular, and pass each line respectively to its corresponding object in the external field (Plate II, fig. 4). If the right eye be closed, the right half of the field is lost; if the left eye be closed, the left half of the field is lost.

For the experiment just described, the several objects in the field are connected *exclusively* with the *nasal* halves of the retinae, those lines which would connect them with the temporal halves of the retinae having been omitted. For the purpose next proposed, we leave the objects in the external field precisely as in the last experiment, but for our present purpose we *omit* those lines that would connect the objects with the *nasal* halves of the retinae, and substitute those lines which connect them with the *temporal* halves of the retinae, so that the field as now prepared comprises a series of objects, these objects being connected by means of the lines of light direction *exclusively* with the temporal halves of the retinae.

Viewed as in the previous experiment with the eyes converged upon the pin, the visual result appears *exactly the same* as that obtained from the last experiment; now, as then, the apparent result is a series of lines issuing from the upper part of the nose, and passing each line respectively to the corresponding object in the external field (Plate, II fig. 4), the central line being binocular, those comprising the lateral groups being monocular. There is, however, between these two results a marked distinction. In the former, on either eye being closed, the *corresponding* half of the field is lost, thus connecting very distinctly the visual result with the *nasal* halves of the retinae; but with reference to the result now before us, we remark, that on either eye being closed, it is the half of the field which is on the *reverse side* to the closed eye

which is lost, thus connecting very distinctly the result now before us with the *temporal* halves of the retinae.

In the experiment next to follow, we represent the field as nearly as possible under the conditions of ordinary binocular vision : the same objects are used, and we view them under the same circumstances as in the two previous experiments, *excepting* that in the two previous experiments the objects were connected, first, exclusively with the nasal halves of both retinae, and subsequently exclusively with the temporal halves of both retinae, while in the experiment now under notice each object in the field is connected with the corresponding sides of both retinae (Plate II, fig. 3), such being the conditions subject to which, in ordinary vision, the pictures are received upon the two retinae. The field thus prepared, and viewed as before, *yields apparently the same visual result as our two former experiments*, namely, a number of straight lines, apparently issuing from the upper part of the nose, each line respectively passing to the corresponding object in the external field (Plate II, fig. 4) ; but under the circumstances now described, if either eye be closed, and the field viewed with one eye alone, no obvious difference is perceptible.

The foregoing experiments have all been conducted with the optic axes converged upon a pin placed in the direction of the median plane of the head ; it remains, however, that we arrange a field, *to be viewed with the optic axes parallel ; and this experiment, we may state, forms a very essential link in the present investigations.*

Having prepared our board we draw through its whole length two parallel lines, the distance between these lines agreeing precisely with the distance between the centres of the two pupils ; these are the visual lines, and they may extend to any length, but it should not be less than three feet ; a pin is to be inserted at the end of each visual line, and to the outer side of each line we place four objects, leaving a sufficient space between each two of the objects to give clearness to the result ; we then, as in the other experiments, by means of the lines of light direction, connect each object with the corresponding sides of the two retinae (Plate II, fig. 5).

The field being thus prepared, the proximate end of the board is to be placed upon the bridge of the nose, while the

distant end may rest upon the window sill. The eyes are to be directed, not to the objects arranged upon the board, but to a remote object—a distant tree for example—care being taken that the eyes are not converged upon any individual part of the object to which they are directed.

The visual result under the circumstances described comprises one central line (the resultant image of the two visual lines), apparently springing from the root of the nose, and passing in a direction agreeing with the median plane of the head, with two lateral groups of lines, these lines passing each line respectively to the corresponding object in the external field (see Plate II, fig. 6). It may be further noted that there are three distinct images of the pins placed at the ends of the visual lines. It becomes obvious, therefore, that when the field is viewed under conditions agreeing with those of natural vision, whether with the optic axes converged or parallel, the visual result is the same, namely, superposition of the visual lines in the direction of the median plane of the head, with two lateral groups of lines, these lines passing each respectively to its corresponding object in the external field. Still it may be observed that in viewing the field with the optic axes parallel we have double images—two pins are placed before the eyes, one at the end of each visual line—and in the visual result we perceive three images of the pins, the central image being binocular, the two lateral single. We remark that this phenomenon is not only consistent with analogous results obtained when the field is viewed with the optic axes converged, but that it is in perfect harmony with the phenomena of natural vision; for example, if two fingers be held in the direction of the visual lines, while the eyes are directed to a more distant object, if the optic axes be converged, the lateral images will be present; and if either eye be closed, the optic axes being converged, the image of the opposite side will vanish, the reason being that the images of objects placed in the direction of the visual lines are referred, not only to the axes of the two retinæ where the visual result is one true binocular picture, but the images of objects so placed are also simultaneously referred to the *temporal* halves of both retinæ. Hence, under these conditions (that is, whether the optic axes be converged or parallel), double images are apparent.

We have now before us a series of experiments, including those which relate to the theory of Hering, those which have reference to the visible direction of the visual and median lines, and also those which illustrate, first the distinct, and subsequently the reciprocal action of the great tracts of the retina; but it is important before we proceed to draw our conclusions, that we should first observe how far the means we have employed in conducting these experiments are consistent with the requirements of natural vision. Be it then remarked, that in these experiments the field is viewed without lenses or other artificial appliance, that we impose no restraint upon the visual organs, and that the objects to be viewed are so placed with reference to the eyes that their images fall upon the two retinae precisely as they do in natural vision; the rule being, when convergence is the condition proposed for illustration, to direct the eyes as in natural vision, and to keep them steadily fixed on the point converged upon; and the rule, when parallelism is the condition proposed, being to direct the eyes to a remote object and to avoid converging them upon any part of the object viewed.

It may, however, be remarked that in these experiments the different sections of the retinae are brought into *distinct and separate* action. It remains, therefore, that we inquire whether, in the means we have employed, there be anything inconsistent with the conditions of natural vision. It is then observable that to obtain these results *we merely leave out of use*, in each experiment, those sections of the retinae the action of which is not the subject proposed for observation. Thus, for example, in the first experiment, the purpose being to observe the action of the *nasal* halves of the retinae, *we leave out of use* the *temporal* halves. In the second experiment, the purpose being to observe the action of the temporal halves of the retinae, the nasal halves are left out of use. That in these arrangements there is nothing inconsistent with the conditions of natural vision,—nothing tending to the disturbance of the visual function,—is, we think, sufficiently apparent from the absolute precision with which each section respectively can discharge its solitary office; and, so far from the means employed in these experiments being disturbing to the visual function, we think, on the contrary, that it is a necessity for undisturbed vision

with two eyes that the different sections of the retinæ should, in a sense, be independent each of the other. Were it otherwise that change and interchange, which in ordinary vision are constantly occurring between the different sections of the retinæ, would become a fruitful source of visual disturbance; and that such would be the case admits, we think, of rather extended illustration. But, for example, the presence of intervening objects must frequently prevent the transmission of a portion of the picture to one retina, while this portion of the picture falls unimpeded upon the opposite retina, and yet without any disturbance to the visual function, the result being a perfect picture. We may also refer to the phenomena connected with the blind spot, as being admirably illustrative of the vicarious action of the different sections of the two retinæ; the blank which exists upon the nasal half of one retina being so covered by the temporal half of the opposite retina that the continuity of the picture, both eyes being open, is well preserved. *We venture then to think that the conditions imposed upon the visual organs in conducting the above experiments are, in all respects, consistent with the requirements of natural vision.*

How, then, comes it to pass that the visual apparatus admits of being thus taken to pieces (so to speak), and without any perceptible disturbance to the visual function, while in the results obtained from the experiments of Hering we find the clearest evidence of marked and unequivocal disturbance? The reason, we think, is obvious: in the experiments of Hering the eyes are submitted to enforced conditions, *and the images fall upon the retinæ under circumstances opposed to those laws which rule the phenomena of natural vision*; while in the experiments we have been last considering, the laws of natural vision have been respected. And under the present view of the subject the solution of the above query may, we think, be traced to a single fact—a fact, too, which has been denied or, at least, studiously ignored, by those who maintain the psychological theory,—namely, *that the visible direction of every part of the retina is fixed and constant.* This being so, the direction of each individual part of the retinæ, whether it be acting alone or as an integral portion of the entire mechanism, remains *unchanged*.

Our closing experiment, to which we now turn, may be regarded as forming an important feature in the pre-

sent inquiries; it consists in viewing the field subject to the same arrangements as in the other experiments, excepting that in this experiment *the field is viewed with the optic axes parallel*. Now that there are two conditions of vision, the one with the optic axes converged, the other with the optic axes parallel, and that these two conditions are equally natural, and both of constant occurrence, cannot be denied; *we regard it, therefore, as essential to the completeness and to the integrity of the present inquiries* that our observations should include both these conditions; and *must it not be a mistaken, or at least an inadequate view of the subject, which would attempt a solution of the phenomena of binocular vision by means that will not equally apply, whether the optic axes be converged or parallel?* We remark that the observation under notice must be regarded as forming an important link in our present investigations, and that we should direct attention to this point becomes the more essential from the circumstance that the phenomena on which Hering bases his theory *require* not merely convergence of the eyes, but they *require* a very near, not to say a *forced convergence*; hence it is that our experiment with the optic axes parallel *assumes for the present inquiries a special significance*. And *we venture to affirm that phenomena similar to those on which Hering bases his theory cannot be obtained with the optic axes parallel*; while in connection with our own experiments, no such discrepancy is found to exist, but, on the contrary, whether conducted with the optic axes converged, or with the optic axes parallel, the results obtained are the same (see Plate II, figs. 5, 6).

Reference has already been made to the uniformity of result obtained under the various conditions involved in the preceding experiments; but there remains for consideration another question, and one which is still more pertinent to our present inquiries, namely, *under what circumstances is this uniformity of result obtained?* And if we turn to Plates I and II, it will, in every instance, be found *that the result obtained is associated with and dependent on one dominant fact, namely, that the two visual lines meet in the direction of the median plane of the head, while the images of either side of the field retain their true relation to the visual line of the corresponding side*; the images of the right side of the field to the visual line of the

right eye, the images of the left side of the field to the visual line of the left eye.

These lines, it has been stated, through their whole length represent each line respectively the axis of the corresponding retina. *It becomes, therefore, evident that the bringing together the two visual lines in the direction of the median plane of the head is, under the circumstances previously described, equivalent (so far as the eyes act in concert,) to the superposition of the two retinal fields.*

We may now with some advantage proceed to compare the results obtained from our own experiments (introduced in illustration of natural vision) with those experiments brought forward in illustration of the theory of Hering; and we are led to draw this comparison, not with a view of exhibiting the great *divergence* which unquestionably exists between the results obtained from these two sets of experiments. On the contrary, we desire to make it apparent, that the phenomena connected with the experiments of Hering, and those connected with our own experiments, however conflicting these phenomena may seem, when considered as illustrations of natural vision, will, when viewed from another point of observation, be found to coincide. And we are induced to lay some stress upon this circumstance from a conviction, which has long existed in our own minds, *that the facility with which apparently incongruous phenomena have sometimes been disposed of has tended, not a little, to impede the development of our subject;* for has it not, we would inquire, sometimes occurred, that phenomena apparently inconsistent with foregone conclusions, have, perhaps too hastily, been disposed of as exceptional, anomalous, or illusory; *and this too, when a more enduring investigation might possibly have placed these phenomena amongst the integral verities of our subject.* So far, then, from considering any phenomenon of vision as exceptional, *we would regard every phenomenon as a fact, which with impunity cannot be ignored.*

We avail ourselves therefore of the present opportunity to test the accuracy of our former observations, by comparing the results obtained from the experiments we have introduced in illustration of natural vision with other results obtained from the experiments illustrative of the theory of Hering,

which experiments we regard as being forced and unnatural; our desire being to show that, however adverse the conditions subject to which these different results have been obtained, and however apparently discordant in their character, still they must lead to one conclusion, *and are traceable to one common law*; hence it is, that on the present occasion we are led to recur to experiments which have been introduced in a previous section, *where they have, indeed, received a more complete illustration.*¹

We commenced our observations by viewing, first the visual lines, then the median line, and subsequently the median and visual lines in their relation to each other. The two nasal, and the two temporal halves of the retinae, each pair respectively, were next brought into simultaneous but separate action. These observations were followed by one in which the same objects were viewed, and under the same arrangements, excepting that in this case each object in the field was by means of the lines of light direction connected with *corresponding halves of the two retinae*. The entire group of experiments was closed by viewing the field with the optic axes parallel; thus have we been led from the more simple conditions connected with the experiments relating to the visual and median lines, up to the final and more complicated arrangement of the binocular field, our observations being in the first four experiments conducted with the optic axes converged, and in the last with the optic axes parallel.

The experiment of Hering consists in presenting to the eyes in the direction of the median plane of the head a thin rod or thread. The visual result obtained from viewing the rod under the first condition, namely, with the eyes converged upon its distant end, is shown (Plate I, fig. 2), and by referring to this figure we at once recognise that *distinctive phenomenon* which, through all our experiments, has been the *dominating fact*, namely, that the two visual lines are referred in the direction of the median plane of the head, where they appear as one line; but let it be further observed, that in the experiment before us there are two additional lines, namely, the lines R and L, the line R connecting point *c* with the right retina, the line L connecting point *c* with the left retina, and

¹ See 'Guy's Hospital Reports,' vol. xii, sect. 7.

in the visible direction of these two lines we meet with a correlative fact: it will, by reference to the figure, be obvious that the lines R and L are subject to transposition; the line R, seen by the right eye, being referred to the left side of the field; and the line L, seen by the left eye, being referred to the right side of the field. *Still let it be noted, notwithstanding their transposition, the lines R and L each respectively in its true relation to the corresponding line.*

This experiment precisely corresponds with that in which we view the visual and median lines together, that is, in their true relation to each other. In the experiment illustrative of the theory of Hering, the rod which coincides with the median line of our experiment is seen by the image of the right eye being referred in the direction of the left visual line, that of the left eye in the direction of the right visual line, while the visual lines themselves are referred to the direction of the median plane of the head, where they appear as one line; and if we turn to the observations upon convergent experiments, in which the visual and median lines are viewed in their collective arrangement, *it will be found that the results of these observations may, without the slightest modification, be applied to the experiment of Hering now under notice.*

But the experiments of Hering require that the figure be viewed under two conditions—first, with the eyes converged upon the distant end of the rod, and subsequently with the eyes converged upon point *c*. The result obtained from the first observation, that is with the eyes converged upon the distant end of the rod, has just received our attention. We return now to the second observation, to be conducted with the eyes converged upon the more central point *c*, and by referring to the diagram (Plate I, fig. 3) it may be observed that when viewed with the eyes converged upon point *c*, if compared with the result obtained when viewed with the eyes converged upon point *b*, presents an entirely new aspect, and so is the visual result that the images, as seen with the eyes converged upon point *c*, could not, if compared with the images seen when the eyes are converged upon the point *b*, be considered as a representation of the same objects. Our conclusions upon this complicated experiment will be found

where. We may however here remark that this experiment, which requires for the first observation that the eyes be converged upon point *b* (the *distant* end of the rod), and for the second observation, that the eyes be converged upon point *c* (the *central* part of the rod), stands in close alliance with, in short, is neither more nor less than an amplification of the old experiment with two fingers. It is well known that if two fingers be held in the direction of the median plane of the head,—the one more distant from, the other nearer to, the eyes,—and if the eyes be converged upon the distant finger,—the proximate finger will be seen double; and if, under these circumstances, the *left* eye be closed the image of the *right* side will vanish, and if the *right* eye be closed the image of the *left* side will vanish. But when the eyes are converged upon the *proximate* finger, this finger will be seen single, while the *distant* finger will appear double; and if under these circumstances either eye be closed, the image of the *corresponding* side will vanish.

The solution is evident. When the eyes are converged upon an object in the direction of the median plane of the head, whether that object be nearer to or more distant from the eyes, its images will fall upon the axes of the two retinæ,—the object will, therefore, be seen single; but if, as in the experiment of Hering, the eyes be converged, first upon a more distant and then upon a nearer point, the conditions of vision are entirely changed, and how to reconcile these two opposite conditions, or to bring out of them one harmonious or consistent result, would appear, we think, to be a problem of some difficulty. While the eyes are converged upon the distant finger, the images of the proximate finger will fall exclusively upon the *temporal* halves of the retinæ; these sections of the retinæ belong each, respectively, to the *opposite side* of the field, hence it is that in closing the *left* eye the image of the *right* side of the field is lost, and the converse. But if the eyes be converged upon the proximate finger the images of the *distant* finger fall exclusively upon the *nasal* halves of the retinæ,—sections of the retinæ, which belong each respectively to its *own side of the field*; hence it is (under these circumstances) that in closing either eye, the image of the *corresponding* side of the field is lost. If now we again refer

to the experiments of Hering—and for distant finger read point *b*, for proximate finger read point *c*,—then are the phenomena connected with the experiments illustrative of the theory of Hering, and those connected with the old experiment with two fingers, *identical*; neither can there be any difficulty in tracing these phenomena to their true cause, *and subject to the two-fold conditions of Hering's experiments, it is perfectly consistent that the visual images should exhibit the seeming anomalies* which have been described.

We remark, therefore, that in all the foregoing experiments the apparent position of the several objects in the external field perfectly agrees with the parts of the retinae to which their images are referred; and however conflicting the results obtained from the experiments of Hering when compared with those obtained from our own experiments may at first sight appear, there is a point, viewed from which they perfectly coincide; and the cause is apparent. *The function of vision is ruled by fixed laws; all the phenomena of vision must, therefore, in some sense, and to some extent, conform to, and coincide with, those laws.* The great point at issue between Hering and ourselves has reference to the visible direction of the different tracts of the retinae, which, according to the theory of Hering, is partly subject to the control of the mind; and, in conformity with this view, the experiment which has received our attention is adduced. *We, on the contrary, believe the law of visible direction to be rigidly fixed, and on this belief we take our stand.*

Still, important though it be, the question of visible direction, as it relates to the great tracts of the retinae, is far from being the only source of divergence between the views of Hering and those for which we contend. The adjustment of the fields of the two eyes in the common field of vision we connect with one dominant phenomenon, namely, the bringing together of the two visual lines in the direction of the median plane of the head, while the lateral images retain their true relation to the corresponding visual line. *The space between the visual lines is, as we state, unrecognised in the brain; but of this great fact, Hering takes no account,—in truth it is incompatible with his theory.*

Still, we have endeavoured to show that the facts which are exhibited in our own experiments, and the conclusions at which we have arrived, find additional confirmation in the results obtained from the experiments of Hering. Could we, for example, desire a more remarkable illustration of the distinct and individual action of the great tracts of the retina, than is met with under the enforced conditions of the experiments of Hering?

Evidently, therefore, the phenomena connected with these experiments, notwithstanding the great disturbance in the visual field, *involve no anomaly*; but, on the contrary, when considered in all their breadth and meaning, these apparent anomalies present a consistent and forcible illustration of those laws which Hering in his experiments ignores, and for which we contend.

If it be true that the apparent position of an object in the external field is determined by the position of its image upon the retina,—if it be also true that in the foregoing experiments the objects viewed are seen in perfect accordance with the position of their images upon the retina (and we venture to think that the contraries of these propositions will not be proved), we must then inquire,—Where lies the discrepancy between the phenomena connected with the experiments of Hering and the phenomena of natural vision; and such inquiry will conduct us to the very root of our subject. *The eyes are so formed and so placed with reference to the external field as to ensure, under the ordinary circumstances of vision, a definite relation between the objects in the external field and the corresponding sections of the two retina.* Now it is essential to perfect vision that this relation between the eyes and the objects viewed should be strictly maintained; *yet do we find, both in the experiments and also in the theory of Hering, this fundamental law of binocular vision consistently, or rather we should say constantly, violated*, and the disintegration of the field, observed in the experiments adduced in illustration of the theory of Hering, is due to the enforced dissociation of those tracts of the retina which, in ordinary vision, act in concert. Still, and this is the point to be observed, *given the conditions of these experiments, the results obtained are in perfect conformity with those cognate laws, connected the one with the corresponding, the*

other with the non-corresponding sections of the retina, to which we have previously referred.

The relation of corresponding halves of the retinae to the right and to the left sides of the external field, admits of demonstration : that corresponding halves of the retinae have the same visible direction we can prove. And facts such as these furnish a sure foothold for more advanced observation ; but to accept the conclusions of Hering would, as it appears to us, be to relinquish demonstrable truths for an hypothesis which we believe to be insusceptible of proof. And that Hering, notwithstanding his high qualities of mind, should have adopted the conclusions at which he has arrived illustrates, we think, most forcibly the danger of tampering with that inborn law of our nature which, while it connects identity both of direction and also of sensation with the associate action of corresponding halves of the two retinae, secures distinctness both of direction and also of sensation between non-corresponding halves of the retinae, and if in his theory of so-called covering points Hering has failed it is, we think, because in attempting to find covering points upon the temporal halves of the retinae he has attempted an impossibility.

We have already expressed our opinion that the conditions annexed to the experiments of Hering are forced and unnatural, and any criticism upon the theory of Hering, failing to take cognizance of this fact would, we think, fail in a very important point. These experiments have furnished a basis for a new theory of vision ; we might, therefore, with some reason, expect from the results of these experiments evidence sufficiently clear and decisive to sustain the important conclusions which have been based upon them ; such, however, to ourselves, does not seem to be the case ; on the contrary, the conditions subject to which these experiments have been made are so complicated, the arrangements so exceedingly constrained, that the results obtained must (it would appear) have been gleaned from uncertain and precarious glances ; and so extreme in our view are the enforced requirements of these experiments, that the resultant phenomena may possibly (we have thought) have misled even the author himself. Nor are we singular in our conclusions upon this point, since the same idea appears to have been entertained by Professor Helmholtz,

who also states that he does not find the results of Hering's experiments so clear or so conclusive as their author appears to have considered them. Indeed, that Hering himself has in degree been conscious of this difficulty would appear from his own observations, as expressed in the following quotation :

"The phenomenon exhibits itself with the greatest certainty, precisely at the moment I am thinking least of it ; but the slightest displacement of the glance, the *thinking* of the second image, which appears nearer, suffices to bring back immediately the first image in *front* of the central surface, for the relation of the two images to one and the same object forces itself upon us, which disturbs the purely sensual impression.

"The phenomenon disappears quite spontaneously, as soon as in consequence of the immovableness of the eye, the illusory image enters into a phase of unfavorable contention, as has been explained above. It is evident, then, that many causes may interfere with the result of the experiment. I can only recommend it to those who have a considerable practice with indirect vision, who know really how to maintain a steady convergence, and not only *think* they can do so. It is not in a year, nor even in two, that one learns to perceive the most delicate phenomena of 'diplopie'" ('Physiological Optics,' p. 1022).

Conceding, then, however much we may, the necessity for that education of the visual organs, so largely insisted upon by Hering, we must still think that if simplicity of arrangement with clearness of result be high qualities in experimental research, such qualities do not belong to the experiments connected with the theory of "covering points."

With the theory and experiments of Ewald Hering we have been long familiar ; and it is, perhaps, noteworthy, that while selecting the same point of observation from which to take our respective views, the conclusions at which Hering and ourselves have arrived are extremely divergent. This being so, the idea has sometimes occurred to us that it might be desirable the two sets of experiments should be compared, and the conclusions arrived at duly weighed ; still, that we have not been hasty in taking the initiative is sufficiently obvious ;

and the questions at issue might, so far as we are concerned, have remained in abeyance, had not the subject been pressed upon our more immediate consideration by existing circumstances.

We have now reached that stage of our investigations which requires from us a more critical notice of the phenomena connected with the transverse visual plane; and any attempt to treat of this important region from our own point of view, without a distinct reference to the labours of Ewald Hering, *must* have failed to be thorough, while it would, perhaps, have been scarcely respectful to the author of the theory of covering points; and that special attention should at this period be directed to the experiments of Hering, has been rendered desirable, almost necessary, by a criticism which has appeared in a recent work upon physiological optics; and although we are conscious of some reluctance in approaching this part of our subject, it appears to us, we confess, that the questions at issue are of a kind in which we may, perhaps, be allowed to possess a personal interest.

If, then, we turn to the great work on physiological optics and refer to the analysis of the theory and experiments of Hering—which analysis is by no means favorable, in some respects, perhaps, rather severe—we *shall find, that so far as relates to the anomalies to which our previous observations apply, that these anomalies (it would appear) have received the authoritative sanction of Professor Helmholtz.*

But that the impression we convey may not be erroneous we give the following extracts¹:—

“Here,” that is in the theory of Hering, “we find, as appears to me, the most consistent form which the nativistical theory (the theory of identical points) has received; therefore a thorough examination becomes necessary.”

“Hering has endeavoured to develop, in a more precise way, so as to give to the nativistical theory a wider field than had hitherto been done. The system which he has built is the work of a clear and logical mind. He takes into consideration all the facts known up to the present, and also some new and important facts which Hering himself has dis-

¹ ‘Physiological Optics,’ p. 1016 and 1019.

covered. This, in my opinion, may be considered as a good specimen of this class of theories.

It must, then, be regarded as no slight tribute to the claims of Hering that his theory has, by Professor Helmholtz, been selected for criticism, because, in his judgment, it appears to embody the most *consistent* illustration which the theory of identical points has yet received.

To place the results of our own observations in antagonism to the expressed opinion of Professor Helmholtz would doubtless be regarded as a step which prudence could scarcely suggest ; and yet either we must forego the privilege of individual observation, or accepting as the result of the task we have undertaken, and which has, we think, been rather forced upon than sought by us, we must, against this decision, *enter our respectful protest.*

We have not, we think, altogether failed in proving the great divergence which exists between the theory of covering points, as enunciated by Hering, and the theory of identical points as heretofore this theory has been understood ; and to ourselves it appears unfortunate that the theory of Hering should have been placed in the same category with that of identical points.

The two theories are essentially different, and they should be judged by their individual merits. It has gone forth to the world that, in the theory and experiments to which our previous observations have been directed, Professor Helmholtz discovers what in his judgment appears to be the most *consistent* illustration of the theory of identical points. Whatever, therefore, may be the objections of Professor Helmholtz, either to the opinions or the experiments of Hering, they can, it would appear, have no reference to their *consistency, viewed as an exposition of the theory of identical points* ; and to this fact it is that we address our remarks. Notwithstanding then the preponderating influence which must attach to the opinion of this eminent philosopher, we take leave, with all deference, to place upon record some of the facts which we believe ourselves to have proved by actual experiments. Our statements are :—

That the images of all objects placed within the transverse

visual plane are referred to the opposite side of the field—that is, to the side of the field opposite to that occupied by the object viewed; and we remark that this phenomenon is special to the transverse visual plane.

That in selecting the transverse visual plane as the region for his experiments, and in having applied to the field general the exceptional phenomena special to this region, Hering has committed an error, which is fatal alike to the consistency of his experiments, and to the soundness of his conclusions.

That the phenomena on which Hering has based his theories are inseparably connected with a near convergence of the eyes, and we assert that similar phenomena cannot occur, the field being viewed with the optic axes parallel.

How then to reconcile the results of our own observations with the authoritative opinion expressed by Professor Helmholtz becomes a problem of some difficulty. We venture, therefore, respectfully to invite the attention of this celebrated observer to our statements, as embodied in the above propositions; and may it not be hoped, that to adjust these apparent discrepancies will be regarded as an act not unworthy of his great reputation.

PLATE I.

Figs. I, II, and III are adduced in illustration of Mr. Towne's remarks upon the theory of Hering.

Fig.

I.—A rod ($a-b$) is placed in the direction of the median plane of the head, and viewed with the eyes converged upon its distant end (b); the lines R and L represent the direction of the rays of light, connecting point C with the two retinæ. The dotted lines indicate the direction of the two visual lines.

II.—Shows the visual result when the rod is viewed as above described. The rod is seen double, and the images appear in the direction of the visual lines; the visual lines are referred in a direction agreeing with the median plane of the head; the lines R and L are transposed, the line R of the right is seen on the left side of the field, and the line L of the left is seen on the right side of the field.

III.—Shows the visual result when the eyes are directed to the central point (C); under these conditions the fields of the two eyes are *distinct*, and lie transversely across the common field, the field of the right eye obliquely from the left to the right, and the field of the left eye from the right to the left. The field of the right eye is crossed by horizontal lines, and that of the left eye by slanting lines. The rod is seen double; its images intersect at point C, and form a cross.

IV.—Represents the visual lines; the apparent result is a single line in the direction of the median plane of the head, Fig. V.

VI.—Represents the median line; the direction of vision is shown by the dotted lines. The apparent result is two lines seen in a direction nearly agreeing with the visual lines, Fig. VII.

VIII.—Shows the visual and median lines viewed simultaneously; the visual lines are drawn as uninterrupted lines, the median line is represented as a dotted line. This line is seen double, the images are referred nearly in the direction of the visual lines. The visual lines are referred in the direction of the median plane of the head, and appear as one line, Fig. IX.

X.—Lateral images are introduced. The visual result is seen in Fig. XI, where it may be observed that these images, although transposed, retain their true relation, those of each side respectively, to the corresponding visual line, the two visual lines being referred to the centre.

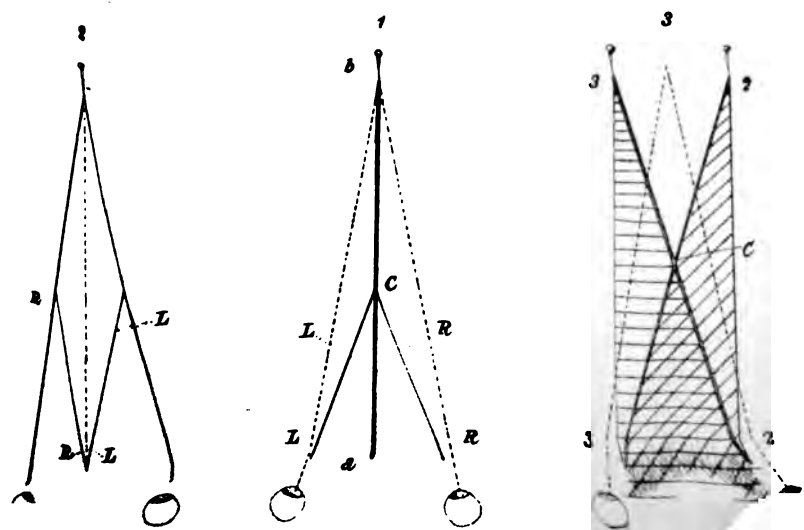
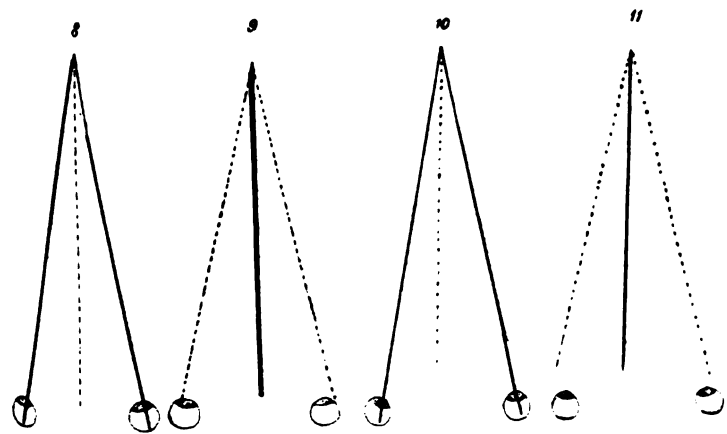
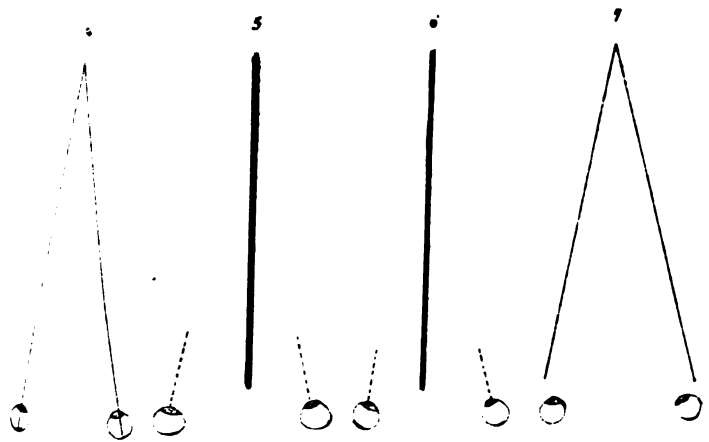
PLATE II.

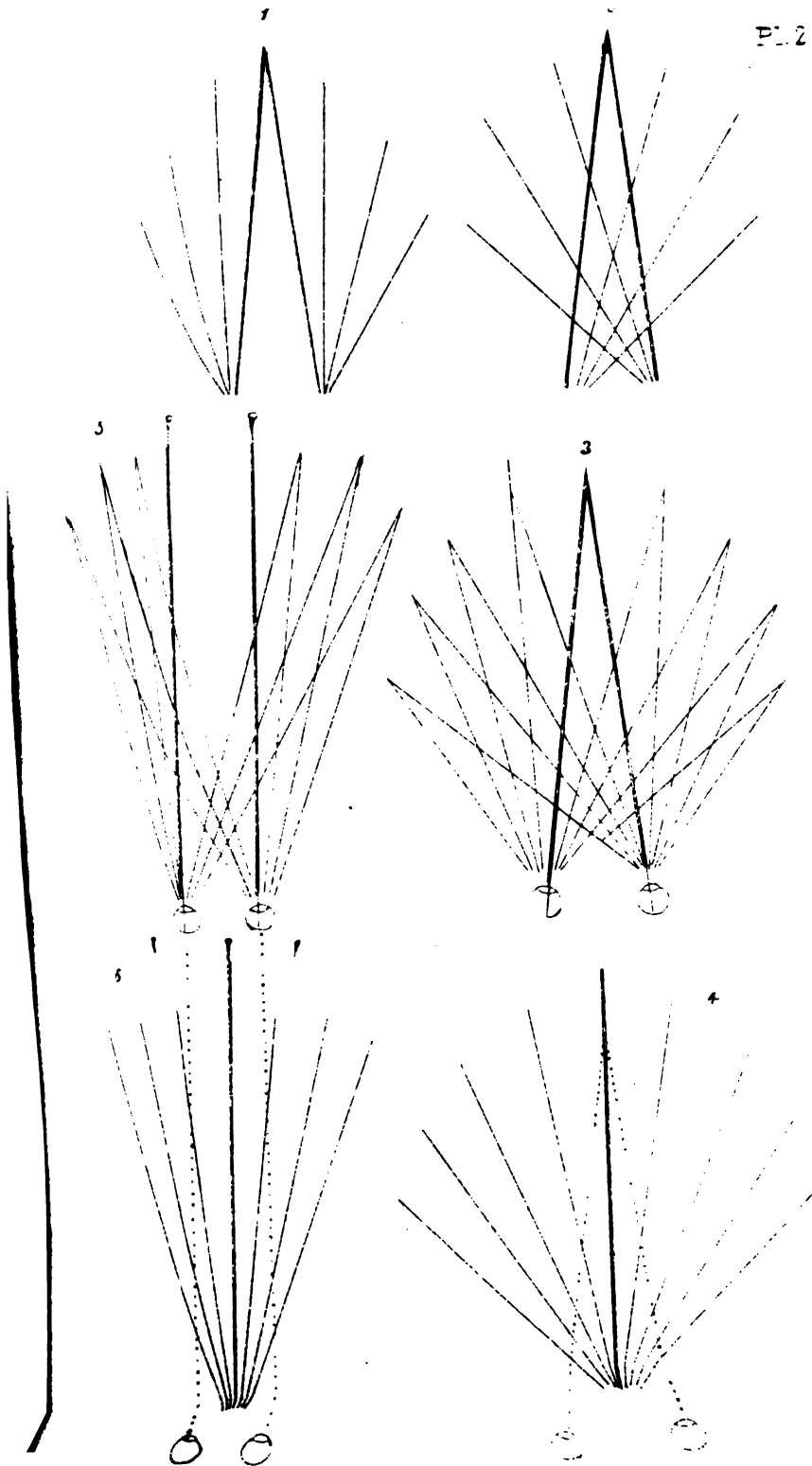
Fig. *I*.—Shows the field viewed with the eyes converged upon a pin in the direction of the median plane of the head, the objects being connected exclusively with the nasal halves of the retinae. For visual result see Fig. *IV*.

Fig. *II*.—For this experiment the objects are connected with the temporal halves of the retinae. The visual result is identical with that of the last experiment. See Fig. *IV*.

Fig. *III*.—The objects are connected with corresponding sides of the retinae. The visual lines appear as one line in the direction of the median plane of the head, while the collateral lines are seen as two distinct groups, the resultant lines apparently issuing from the upper part of the nose. The visual result is shown at Fig. *IV*.

Fig. *V*.—The objects for this experiment, as for the last, are connected with corresponding sides of the retinae, but in this instance the field is viewed with the optic axes parallel. The visual result is shown at Fig. *VI*, and agrees precisely with the result obtained when viewing the field with the optic axes converged. See Fig. *IV*.





FURTHER OBSERVATIONS
ON
CATARRH OF THE TYMPANUM.

BY JAMES HINTON.

IN the last number of the 'Guy's Hospital Reports' I related a few cases illustrating the treatment of some forms of this affection by incision of the membrane and evacuation of the collected mucus. Another year has added somewhat to my experience of the value of this method, and has made me aware of some fresh points in the nature and progress of the affection.

I may first relate the following case as one very characteristic of a frequent form of the disease.

CASE 1.—Deafness, with recurrent attacks of Inflammation in each Tympanum, since Scarlatina six years previously. Evacuation of small dense masses of mucus by incision.

May 14th, 1868.—M. G—, æt. 12, a healthy boy; at age of 6 had scarlatina, followed by discharge from the right ear only, lasting about fourteen days. Ever since he had been decidedly deaf in the right ear, and, with the exception of two years, had been more or less so in the left, and subject also to frequent attacks of pain, during which any sound, as music, &c., became painful. Yesterday he was so deaf that he did not hear an express train passing. My watch was heard on contact on the right side, and one inch on the left; the tuning fork was heard well upon the vertex, louder in the better ear.

Each membrane appeared very concave, especially the left, and on this side also there existed a small white dimple anteriorly, apparently a healed perforation. The throat was red and pale. He could not inflate the tympana. Air was introduced through the Eustachian tubes while he swallowed with much difficulty, entering the tympanum with a sharp sound, and improving the hearing on the right side to twenty inches, and on the left to twenty-four, the membrane being afterwards convex posteriorly. Ferri perchlor., Lix. Salt and water to be drawn through the nose.

In a week the improvement only partially continued, the inflation was repeated, again with advantage, the entrance of the air being a moist squeak. He returned to the country, where deafness returned in three weeks. It was again removed by inflation on four or five occasions during the course of four months; general treatment and application to the throat being carefully carried out. But the effect of introducing air into the tympanum became less with its repetition. The sound was always sharp and moist. In November he had an attack of pain in the right ear, treated by two fomentations, &c.

Jan. 24th, 1869.—I saw the patient with Dr. Bickerton of Liverpool. The right ear had remained very deaf, but had lately been subject to pain again; the left ear for four days had been in acute pain, attended with discharge, but not relieved by it. Watch not heard on either side, and only in contact on the left. The right membrane was of a dull grey, and somewhat prominent posteriorly; the left meatus was red, and covered with loose flakes of epithelium. The membrane was red and swollen, and bulging posteriorly. Inflation again improved the hearing somewhat. A solution of bicarbonate of soda applied below the left ear, a solution of bicarbonate of soda syringed through the nostrils daily, a lotion of borax was poured into the left ear, and an ointment of iodide of potassium and aconite applied around it. The ears to be inflated alternate days.

In a week he was much better, the redness and swelling gone; watch heard each side at fourteen inches. As, however, I had formed the decided opinion that the continued pain and deafness depended upon the presence of

secretion in the tympanum, and that its removal afforded the only prospect of permanent benefit, I made the usual incision in the right membrane, viz. between the positions of the malleus and incus, and extending from within half a line of the upper to within a line and a half of the lower border of the membrane. I then, after passing air through the Eustachian tube, syringed through it by means of the catheter and an elastic bag, a solution of sodæ carb. (gr. xx—3j). The effect produced by this was that there protruded from the incision a white shining mass, which partly receded on ceasing the pressure, and that neither air nor fluid could be passed through it. The orifice was, in short, evidently filled by a firm substance, the appearance being that of fluid enclosed in a membranous bag. For the next four days the injections of air and solution of soda through the Eustachian tube were repeated, and with the effect of washing out, through the perforation, small dense masses of white mucus; on the fifth day the incision was healed. The same treatment was then adopted for the left ear, and with very similar result. At first, on injecting the liquid the incision became plugged, but after repeatedly passing air into the tympanum, a small viscid mass, about half the size of a pea, escaped. The incision healed on the third day. The improvement of the hearing on each side was decided, but not complete, and it appeared evident to me that part only of the abnormal contents of the tympanum had been removed; accordingly the incision was repeated, and with precisely similar results—the gradual forcing out of small dense masses of mucus—twice more on each side. No irritation whatever followed, and the hearing of both ears became, so far as I could judge, absolutely perfect, the lowest whisper being heard at a distance of six yards. It was striking to observe, indeed, how perfect the hearing remained, even immediately after the solution of soda had been passed freely through the tympanum. The filling of the ear with the liquid evidently did not even for the moment impair the transmission of sound. The right ear, which had been continuously deaf for six years, appears to have recovered as completely as the left.

In this case the membranæ tympani exhibited a peculiar degree of relaxation, so much so that they *flapped* visibly and audibly, in and out, as the patient forced air into the tympana,

or withdrew it. In their usual position they lay nearly or quite in contact with the inner wall of the tympanum, and on inflation started out into a kind of bladder, bulging up around the malleus, so far as almost to conceal that bone. The inflation was attended with a slight improvement of hearing for the time. After the evacuation of the mucus the membranes gradually recovered their tone, and assumed their normal position.

I believe that relaxation of the membrana tympani, more frequently, however, partial than general, and often accompanied with a distinct *thinning* of its substance, is a very frequent effect of the protracted presence of the mucus within the tympanum. I have, at least, frequently observed the coincidence: nor—apart from the presence of *scars*, which are generally thin—have I distinctly traced a relaxed condition of the membrane to any other cause. This relaxation and thinning of the membrane accompanying the presence of retained mucus, together with the frequent closure of the Eustachian tube, is probably the reason of a fact that would not at first have seemed probable, but which I have continually noticed, viz., that when mucus is present in the tympanum the membrane is more often sunk in, at least in parts, than protruding outwards.

Another point which this case illustrates is the existence of abnormal secretion in the tympanum after a perforation has healed. From many observations I am induced to think that when a perforation is small this frequently occurs, the tendency to heal in the membrane being so strong; hence it is by no means uncommon to find, in an acute attack of catarrh of the tympanum, in which the membrane has given way, and after a discharge of matter of more or less duration has closed that after a short interval the discharge recurs, and on examination the orifice is again found open. I have known the alternate healing and giving way occur more than once. On this ground, as well as others, I have adopted the practice of treating all perforations of the membrane, acute as well as chronic (unless particular conditions forbid it), by washing out the tympanum with a warm solution (of soda or of bicarbonate and chlorate of potash) syringed freely through it. This I do, not by means of the Eustachian catheter, but

in the opposite direction, applying the syringe to the meatus. The nozzle being well covered with elastic tubing, so as pretty closely to fit, without hurting, the meatus, the stream may be sent safely, even with considerable force, *provided the Eustachian tube be open*, and will flow freely through it, escaping by the nostril, the head, of course, being bent well forward. In this way masses of old secretion may be removed from the tympanic cavity in almost every case, and in some cases in quantities almost incredibly large. The cleansing by this means should be repeated frequently—every second or third day is best—until all appearance of any accumulation cease, and then a weak solution of sulphate of zinc (gr. ij—x ad ʒj) may be substituted, and used in the same way. It is seldom that an immediate and rapid improvement does not take place, though on every plan of treatment the restoration to a healthy state of the chronically inflamed and discharging mucous membrane of the tympanum, exposed by a perforation, requires patience. In fact, whatsoever morbid condition affects the ear, if it be or have been attended with an excessive secretion within the tympanum, a chief element in its successful treatment is the entire removal of any quantity of such secretion that may be retained, and syringing completely *through* the tympanum is generally the best method of effecting this; its influence is often very marked in the case of polypi. I have met also with more than one case of long-continued pain in the head, and other symptoms of cerebral irritation, obscurely connected with the ear, in which large masses of mucus have been thus syringed out of the tympanum with great relief and improvement of hearing. The following is an instance:

CASE 2.—Inflammation of the left tympanum, with discharge, five years ago; partial recovery; twelve months ago return of discharge from the ear, with pain extending over the head; three "epileptic" fits; polypus in the meatus; membrana tympani incised, and masses of dense mucus removed.

October 9, 1864.—T. N—, æt. 20; fair complexion and healthy. Father lately somewhat deaf: an elder sister had

died from abscess in the brain caused by disease of the petrous bone, treated as neuralgia. Six months before he had pain in the left ear, which subsided without discharge. Three months ago there came from it a discharge of matter and blood, which still continues to a slight extent. No pain, but a constant loud noise in the ear, like two men sawing wood. Watch r. 40 inches, l. 2 inches; right ear healthy; from the left some flaky discharge was syringed, and the membrane presented a peculiar appearance, due, partly, as it afterwards appeared, to a collection of epidermoid scales at the upper part, surrounding a depressed spot, possibly a minute perforation, but no air escaped on inflation. The rest of the membrane was rough and somewhat red, and irregularly drawn in. On inflation air entered with a harsh clap; the hearing being somewhat improved, and the tinnitus rapidly ceasing. He was treated with lotions, applications to the throat, repeated inflation of the tympanum, and iron and quinine; the discharge entirely ceased; the hearing rose to eight inches; the membrane became of natural appearance, except just above the short process, where there was visible a small, dark, shining spot, surrounded by a dull white surface, like a depression with raised edges. [In all probability the dark spot was the enlarged foramen of Rimini, and the white ring around was constituted by matter collected around the neck and head of the malleus.] The ear felt quite well, the health stronger, and the hearing sufficiently good. On the 12th of February, 1865 (two months later) the condition was the same.

I did not hear of the patient again until 14th September, 1869, when he came to me suffering considerable distress, and with the following history:—Until about twelve months before he had continued well, then without cause the discharge returned from the left ear, and it became very deaf. There was no pain for two months, then it became severe, but did not seem deep in. Tinnitus was present then but had now ceased. Six months ago he became very ill, having severe shivering and fainting. His medical attendant states that he had at that time two "fits" of decidedly epileptic character, and a few slight ones since. There was no pain in the ear then, but the day before he became ill the discharge ceased, and it returned as he got better. The ear was tender after lying on

it. Lately he has had pains drawing across the forehead and concentrating themselves in the ear, lasting a day or so. He was blistered, and brought under the influence of Ung. Hydrag., and then the head symptoms ceased.

A polypus, about the size of a horse-bean, was found growing from the upper part of the membrana tympani, and adjacent roof of the meatus. This was removed, and the upper wall of the meatus being red and swollen and very tender, an incision was made along it through the periosteum. The bone was not rough. The membrane was not perforated. Air entered when blown in with a loud moist sound, increasing the hearing to four inches for the watch. The incision of the meatus gave partial relief, but as there was evidently fluid within the tympanum, the membrane was incised on the next day, and a solution of soda syringed through the cavity of the meatus. On two successive days this brought away a large quantity of tenacious mucus of dark colour, with a complete sense of relief to the head, and immediate improvement of the hearing to twenty inches. In five days the membrane was healed, and under the application of chloroacetic acid the polypus had entirely disappeared in a fortnight more.

Among the complications of accumulation within the tympanum, one of the most frequent is obstruction of the Eustachian tube. For the most part this is dependent on the swelling of the mucous lining and on inspissated secretion, and is sufficiently treated by inflation of the ear during swallowing, and by the passage of the alkaline and astringent fluids used to wash out the tympanum. But this is by no means always the case. Sometimes the constriction is of the intensest and most obstinate character, and requires for its removal the most vigorous and persevering treatment. The most efficacious means for this end are, besides syringing solutions of the alkalies, or of nitrate of silver, or sulphate of zinc into the tube, the introduction of bougies of laminaria, or of very small elastic tubes passed through the Eustachian catheter, and along the tube as far as possible; air or fluids being then injected through them, so as to exert a direct pressure upon the constricted portion. By these means, used with sufficient perseverance, which, however, sometimes needs

to be very great. I have never known a failure in securing a permanent and well sustained position of the tube; and if the ear was afterwards subjected to an uninjured condition of the parts, I have never known improvement of the hearing fail to ensue. The following case was one of this kind.

Case I.—*History of pneumonia, a catarrh of the right ear, and subsequent inflammation of the Eustachian tube, cured by syringing, and resulting in perfect recovery of hearing.*

August 1st, 1868.—J. H. M. On the right side she had been deaf as long as she could remember, and her mother traced it to some affection of the ear occurring at the age of six weeks. The left ear had been liable to attacks of deafness during colds for some years, and has now been deaf for about a fortnight. In each ear she has had occasional attacks of pain and itching, sometimes 10 inches. Tuning-fork well heard on the vertex; louder on the deeper side. R. M. T. very concave, dark, and shining with the glistening appearance of yellowish fluid just visible posteriorly. L. M. T. also very concave, slick, and white. On inflation air entered the left only, with a wheezing sound, which 14 inches. The right membrane was incised, and a little viscid mucus cozed out. No air could be passed through the tube; w. 10 inches. The improvement on the left side continued under repeated inflation of the ear, the sound given by which, however, was distinctly moist; and the membrane was evidently relaxed and tending to fall inward. This ear has, however, continued fairly well, though liable to slight attacks of pain, and evidently still containing a certain amount of abnormal secretion, without the removal of which it is hardly likely to be permanently useful. The treatment of the right ear was more complete. On this side the removal of the mucus produced immediate improvement, but this was almost wholly lost as soon as the incision healed. Three times the incision was repeated with the same result, all attempts to gain a passage through the Eustachian tube, including syringing through the incised membrane, with considerable pressure, being in vain; and on October 21st, 1868, considering that the evidently morbid condition of the other (the left) ear rendered

it the more desirable to restore the right if possible, I addressed myself thoroughly to the attempt to gain a passage through the tube. The means used [besides various applications to the throat] were at first the introduction, every other day, of bougies, either elastic, or of laminaria, or of softened whalebone, followed by the syringing of astringent solutions into the tube.

On November 17th, while inflating by the nostril, after the use of a laminaria bougie, the air escaped into the cellular tissue, causing some swelling of the soft palate and uvula. These were pricked, and in two days all swelling had subsided. Treatment, however, was omitted for three weeks, at the end of which time it was resumed by the introduction, at very short intervals, of a small elastic tube passed through the catheter as far as possible along the canal, air and a solution of carbonate of potash being then strongly injected through it. On February the 2nd a small stream of air was in this way distinctly heard to enter the tympanum; at the same time some mucus, which was plainly visible, was evacuated by incision from the anterior part of the cavity, a solution of soda being syringed through the tympanum and tube in each direction, and the hearing immediately rose to forty inches. On the next day, however, the tube was closed again, and only a laminaria bougie could be passed along it. For some weeks this continued to be the case, the tube closing immediately after it had been made pervious; so rapidly, indeed, that it happened more than once that I syringed a solution of soda freely and completely *through* the cavity in the morning, and in the evening not even air would pass. On the 9th of March the membrane was incised for the last time, and a viscid, very yellow matter was washed out; but it was not until the 16th April that the tendency of the tube to close was overcome. On that day I syringed into the tympanum a solution of nitrate of silver (gr. v ad ʒj), occasioning temporary pain. In the evening the pain returned severely, lasting for some hours; the next day the ear was easy; and on the following one, while blowing her nose, the air suddenly entered the tympanum. From that time she has always been able to inflate it easily; and the hearing is, so far as I can judge, perfect. The watch is heard at forty inches, the full average distance, and a low whisper at over six yards. The membrane

has now, after an interval of seven months, an almost perfectly normal appearance. It is, perhaps, somewhat white, and yields a little in excess on her inflating the tympanum.

The accident of effusion of air into the cellular tissue around the Eustachian tube is liable, of course, to occur if the least abrasion of the surface be caused, and perhaps can hardly be absolutely guarded against, if the opening of an obstinately occluded tube is to be attempted at all. So far as my observation extends, it is not of any serious consequence, though probably, under some circumstances, it might be so. The inflation of air should, of course, be very carefully performed when it follows the introduction of a bougie; but it is satisfactory to find that the occurrence of emphysema offers no obstacle to a complete cure. Dr. Guye, of Amsterdam, has reported¹ two cases of emphysema thus produced, in one of which some temporary difficulty of breathing occurred and other observers have also referred to cases; but none have been attended with more than a little inconvenience of a few hours' duration.² I believe a soft elastic bougie cannot produce any risk of emphysema. On only one occasion have I known it follow the use of the catheter alone, and that to very slight extent. With moderate caution the use of laminaria for bougies may be considered perfectly safe; nor do I now hesitate to leave them as much as twenty minutes in the tube. If they be allowed to swell the precaution must be taken of withdrawing the bougie and catheter together. Two cases have been reported in which a laminaria bougie broke off in the tube; but in each no mischief followed, the fragments coming away in a few hours, in one case during a fit of sneezing, and in the other without any irritation whatever.

¹ 'Archiv der Ohrenheilkunde,' vol. i.

² While on this subject it may be worth while to refer to two supposed fatal cases occurring in the treatment of ear disease by the Eustachian catheter and air-press, which made a considerable sensation in London about thirty years ago, and seem still to remain as a kind of tradition of the danger of employing the Eustachian catheter in any case whatever. So far as I can interpret the reports of the inquests on those cases (see 'Lancet,' 1836), it appears to me that in one the death was a mere coincidence, and arose from disease of the heart; in the other that an extreme of violence was used, the force being applied, indeed, by the patient himself under the direction of an unqualified assistant. In this case I should infer—for the details of the post-mortem are insufficient—that emphysema had occurred to an enormous extent, and had caused death by suffocation.

Among the signs of the presence of mucus in the tympanum, a very characteristic one—though by no means constant, and not in itself to be taken as decisive—is the patient's own feeling of something being present in the ear, and moving as the head is moved. In some cases this feeling is so strong that it gives rise to a habit of giving the head a peculiar shake, as if to shake something in the ear out of the way, especially during the attempt to listen. Another peculiarity of hearing which some time ago attracted my attention, but which I then failed to comprehend, I believe has a similar explanation, viz., the hearing better when the head is held down on the affected side. The difference is sometimes very marked, and I have recently observed it to exist with other palpable evidences of retained secretion. Sometimes it happens that the line marked by the upper border of the fluid may be plainly seen through the *membrana tympani*, and may be observed to change its level on change of position of the head; this, of course, occurs only when the fluid is thin and free to move, the membrane not being collapsed.

But when a quantity of thin serous fluid escapes from the tympanum on incision of the membrane, it must be remembered that a denser portion may still remain behind. I have no doubt that some of my earlier cases failed of their possible success from my ignorance of this circumstance. In one case I twice incised the membrane, some thin fluid only escaping, and scarcely anything more on syringing through the tympanum, with very slight relief; but on making the third incision, a large quantity of extremely viscid secretion was removed, and with much greater effect. In this instance my course was dictated by the fact that the symptoms continued to indicate a repetition of the treatment, and it may be remarked that, as a rule, if the incision is really required at all, it is most frequently demanded more than once; twice may be regarded as the rule, but in some of the most satisfactory cases it has been needed three or even four times. I consider it better to suffer the incision to heal quickly, and to renew it, than to attempt to keep it long open. Fortunately the incision is attended, as a rule, with very little pain, unless the membrane be inflamed, when it is apt to be acutely painful. On one occasion I incised the membrane on each side in a girl aged eight,

one with chloroform the other without. After some time it became necessary to repeat the operation on one side the child preferred *not* to take the anæsthetic. As a however, it is better to give chloroform in the case of y children, as it is difficult otherwise to keep them suffic still, and chloroform or bichloride of methylene (as give Guy's Hospital) I have found in this respect preferable to nitrous oxide.

I have only found three ill results attend the oper The first is division of the chorda tympani nerve, which happened only once in my experience. The patient f sudden shock running down into the tongue, the correspo side of which suffered an impairment alike of general an special sensibility in its whole extent, so far as I could j but began to recover after two or three days. A good de pain was complained of in the ear, apparently due to injury of the nerve, and was renewed on syringing. This however, was but temporary, and the incision healed The patient shortly after left the country, and I have no had a further report from her. In one case, that of a aged eight, who had had convulsions in infancy, and to v nitrous oxide was given, an attack of convulsions ensued about two hours, and the treatment was suspended. The frequent ill effect is the trifling one of an inflammatory e ing of the external part of the meatus, which is exceed painful, though not otherwise serious. When I see reasc apprehending it I use the Eustachian catheter, and syring the tympanum from within instead of from without. In cases, however, the syringe is scarcely necessary at all mucus being removable by the forceps alone. I have i way drawn out into the meatus, in the form of a viscid masses larger than a nut.

An inflammation of the meatus may, no doubt, be c by this operation; but it would be by no means corre suppose such a connection in every case in which th inflammation might follow, since I have observed it to in a very severe form in various instances in which I abstained from operating. I think it the best rule, how never to incise the membrane while any irritation of the m exists; but no doubt there are exceptions.

Since most of the cases I have referred to have been successful ones, I think it is better to relate briefly one in which I was entirely unsuccessful. Such cases, no doubt, will continue to occur; but I believe that a good diagnosis, such as one may very reasonably hope to attain, would reduce them to an exceedingly small percentage.

CASE 4.—*Deafness on the right side, eighteen months; tinnitus; incision without effect.*

January 26th, 1869.—Mrs. H. J—, æt. 49; healthy, not subject to nervous attacks nor to colds; found herself deaf in the right ear eighteen months ago after a “bilious attack;” no pain in the ear, but from about that time has been subject to a frequent roaring like the sea. W., r. 1 in., l. 30 in. Tuning-fork heard fairly on the vertex alike in each ear; louder on the vertex than before the right meatus; closing the meatus increases its sound on the left side; has no effect on the right. R. m. t. moderate curve, of a streaky whiteness posteriorly; anteriorly of a shining yellow appearance, generally of a *rigid* look. Inflation of air produced no effect. A solution of hydrochlorate of ammonia (gr. x— ʒi) with Hydrarg. Perchlor. (gr. $\frac{1}{4}$ — ʒi) was injected into the right tympanum by the catheter weekly for seven weeks. The immediate effect was to dull the hearing, but it always fully recovered, and the patient thought she was less affected than usual by a cold which she caught. On April 19th the appearance of the membrane had altered somewhat, and there appeared at the lower and anterior part a distinct yellowish prominence, brightly shining. An incision was made in this part, immediately after which the tinnitus was less, and the hearing slightly improved. Alkaline solutions were syringed through the tympanum for five days, but without effect. The incision healed without irritation, and the hearing continued uninfluenced.

In the following case, in which very considerable improvement resulted at first, I failed to make it permanent; perhaps owing to the presence of firm adhesions; perhaps from the condition of the nervous system.

CASE 5.—Deafness, increasing for four years; dense matter removed from the right tympanum; improvement only temporary.

March 30th, 1869.—Bessie L—, a governess, pale, but healthy; having had domestic trials; liable to colds. Had been growing deaf about four years; first, and most, in the right ear; never pain, discharge, nor tinnitus; ascribes it to colds; has cracks in the ears when she gapes or blows her nose, and after these often hears better for a time; is better in a noise or when excited; throat healthy. W., l. 2 in., r. only a repeater, close. Tuning-fork on head not well heard, louder on right side; on each side louder on vertex than before meatus. R. m. t. of dull, yellowish tinge, moderate curve; l. m. t. less dull. She just inflates each tympanum. Without much delay the right membrane was incised, and the tympanum daily syringed through. By degrees much dense and dark coloured matter was removed by the meatus, some being so adherent as to need to be drawn through the orifice by the forceps. The hearing improved greatly, the watch being heard at half an inch.

On May 15th she returned, the hearing having somewhat gone back; the incision was repeated, and with some advantage. After the incision had healed, she was advised, among other things, to blow into her right ear once a week, for eight weeks, a solution of bicarbonate of soda (gr. x— $\bar{3}$ i); this being done by first syringing it into the throat through the nostril, the head being well inclined to the right side.

On August 12th I saw her again. The right ear was as before. The incision was repeated, and a little viscid matter removed, but there appeared to be firm adhesions present, hindering the escape of the fluid through the orifice; nor did my utmost endeavours suffice to mend this condition. In this case some irritation was induced, soon, however, subsiding.

At what limit of age this method of treatment would become inapplicable I do not know. I conceive, however, if the case be otherwise suitable, the age may be one considerably advanced, since I applied the treatment in the case of a gentleman, aged

sixty-six, in whom, besides the presence of mucus, the membrane was much collapsed, and the Eustachian tube obstructed, and with very decided success, though the deafness, being re-induced by a severe influenza, returned again after an interval, and circumstances prevented an effective renewal of the treatment.

CASES

ILLUSTRATING THE

DISEASES OF THE UPPER AND LOWER JAWS,

WITH REMARKS.

By THOMAS BRYANT.

IN the following paper I propose to illustrate some of the diseases of the upper and lower jaws; to show their origin, course, and results; not forgetting to point out any peculiarities in the histories of the cases quoted, and the treatment that appeared applicable to each.

The cases may be accepted as types of the different classes they represent.

The inflammatory affections, as ending in necrosis, will primarily occupy our attention; the subject of tumours of the jaws claiming a subsequent notice.

PART I.

On necrosis of the bones entering into the formation of the jaws.

Cases of inflammation of the jaws terminating in necrosis are by no means uncommon. In hospital experience many such come under observation, and although they cause much anxiety to the patient, from the severity of the local symptoms they produce, and the deformity they sometimes cause, to the surgeon they produce no such feeling; for, as a general rule, their consequences are not very serious, nor is their treatment difficult.

As a broad fact, also, they seem to be quite unconnected

with dentition, or with diseases of the teeth; for the experience of dentists seems to be well borne out by that of surgeons, that necrosis of the alveolar processes is rarely the result of disease of the teeth, and when it is, is of a very limited nature. There may be exceptions to this rule, but in general it is a sound and reliable one; for daily experience seems to show that long continued suppuration may continue about a carious tooth without exciting inflammation and death of the alveolar process in which the tooth rests. Inflammation of the bones of the upper or lower jaw has, therefore, other origins, which we propose now to consider.

The most acute and most general in its influence is, without doubt, the phosphorus poison; the disease so produced is now generally recognised as the "phosphorus necrosis," and according to Dr. Bristowe's report to the Privy Council (1863), appears confined to the use of the common phosphorus in the making of lucifer matches. As a Guy's man I may be pardoned for mentioning that the earliest notice of this disease in this country was by my colleague, Dr. Wilks, in the volume of these Reports for 1846-47. At the present time, however, it is so well known as hardly to need a detailed description.

The disease may involve a part only or the whole of the upper or lower jaw, both jaws seeming to be equally liable to the affection; but in the majority of cases the teeth of the affected bone are more or less diseased or deficient, it being a rare thing to find the disease in subjects who have sound teeth, or in any who have a complete set; some openings down to the bone, either through carious or deficient teeth, appearing to be necessary for the phosphorus fumes to affect the bone.

In the following case the teeth that existed in the jaw appeared to be sound, although many were deficient, the boy being at the age when the permanent teeth were coming forward and the temporary teeth were being shed. It is quoted as a good example of the disease.

CASE 1.—Acute necrosis of the lower jaw from the fumes of phosphorus.

On November 23rd, 1863, James S—, æt. 8, was brought to me at Guy's Hospital with an acute disease of his lower jaw.

He was a match maker, and was constantly inhaling phosphorus. He had been employed at that work for about one year.

The disease began two months previously with a general aching of all his lower teeth, which were said to have been quite sound; this was rapidly followed by enlargement of the jaw and intense constitutional disturbance. Suppuration followed within one week, and abscess, which burst into the mouth. He had had many of his teeth removed—and these were said to have been sound—before I saw him; the remaining ones were sound. When I saw the boy the soft parts about the jaw were enormously swollen, and profuse suppuration existed within the mouth. The whole jaw-bone appeared to be necrotic and loose, for it could be moved in its bed. I wanted the parents to leave the boy, to have the necrosed bone taken out, but they refused, and I never saw him again. The bone could, doubtless, have been lifted out of its bed. It seemed to have died as a whole.

Remarks.—This case is a good typical example of the phosphorus-necrosis. Its commencement by a general aching of the teeth of the affected bone, and the rapid suppuration and necrosis which followed, are in accordance with the general course of such an affection; for this phosphorus disease is, for the most part, acute in its progress, and is consequently attended with severe local and constitutional disturbance.

With respect to treatment, the removal of the diseased bone is the only sound practice, and this should be done as soon as it is possible—that is, as soon as the bone is loose, and a new one has formed; for when the bone is dead it is only a foreign body, and its presence can do no good, and must do harm. Its removal should be accomplished when possible from the mouth.

Should an operation be attempted before a new bone has formed, the result of the case may not be so favorable as it would otherwise have been, for there seems little room to doubt that the muscles, acting upon the new bone before it has become consolidated, may alter its shape and produce deformity.

Exanthematous necrosis.

This name has been given to that form of necrosis that follows one of the exanthemata or some fever. It has been known to surgeons for many years, but my colleague, Mr. Salter, was without doubt the first surgeon who fairly described it (*vide* vol. iv of the present series of these Reports). The disease appears after fever, such as typhus, scarlet fever, measles, rheumatic fever, or small-pox; it appears to attack patients during the period of childhood more frequently than adults. It, as a rule, appears on the decline of the fever, with symptoms of pain and swelling about some portion of the gums, and rapidly terminates in the death of the bone involved. The necrosis, generally, is confined to the alveolus; but exceptions to this are not infrequent. The alveolus, however, is always involved under all circumstances.

It has fallen to my lot to see many cases, but I have kept records only of a few.

My experience of this disease does not enable me to support Mr. Heath in his opinion, that it is remarkably symmetrical.

Case 2.—Necrosis of coronoid process of lower jaw, &c., after measles.

Charlotte G—, æt. 4, was brought to me at Guy's Hospital on January 21st, 1861, for disease of the lower jaw. It had come on after measles, contracted some nine months previously. Several pieces of bone had come away through the mouth from the right side of the lower jaw, and on January 28th I removed the whole coronoid process and horizontal ramus of the jaw, including the whole thickness of the bone nearly to the symphysis. A good recovery followed, with perfect movement of the jaw.

Remarks.—In this case the whole thickness of the jaw with the coronoid process nearly to the symphysis was necrosed; it was readily removed with the temporary teeth from its bed with a pair of forceps, and a good jaw remained, although without teeth.

CASE 3.—*Necrosis of symphysis and horizontal ramus of lower jaw after measles.*

Harriet V—, æt. 2½ years, came under my care at Guy's Hospital on January 20th, 1866, for necrosis of the symphysis and right horizontal ramus of the lower jaw, following measles eight months previously. On January 22nd I removed the mass of necrosed bone readily from the mouth, the bone including the whole symphysis with the horizontal ramus of the jaw on the right side beyond the mental foramen. A rapid recovery followed.

Remarks.—In this case, as in the last, the whole thickness and depth of the jaw was involved in the necrosis; and the disease occurred very early in life—at the end of the second year. Such cases are not common.

CASE 4.—*Necrosis of the alveolar process of the left upper jaw after measles.*

Louise J—, æt. 10, came under my care on January 10th, 1860, with necrosis of the alveolar process of the left upper jaw after measles. The whole alveolar process of the left side of the upper jaw was removed, together with the permanent teeth from the canine tooth backwards, and a good recovery followed.

In our museum there is also a specimen of necrosis of the alveolus of the lower jaw, with exfoliation of the three temporary and two permanent double teeth, after measles. I removed it from a girl, aged 14, in June, 1861. Prep. 590⁷⁰.

CASE 5.—*Necrosis of alveolar process of upper jaw after fever; exposure of permanent teeth.*

John H—, æt. 7, came under my care on September 12th, 1861, for disease of the left upper jaw. It had been coming on for two months after fever, which was contracted in July. The alveolar process of the upper double teeth was evidently necrosed, and on October 28th it was removed, together with

one tooth, which was sound. The permanent teeth were seen in the gum beneath the sequestrum, and two months subsequently they were firm and coming forwards.

Remarks.—Necrosis of the jaw, upper or lower, is certainly less frequent after fever than it is after measles or scarlatina. Mr. Salter states it to be of rare occurrence, and in this opinion I am disposed to coincide. In our museum, however, are several specimens of such disease, preparation 1091⁷ being probably the best example.

CASE 6.—Necrosis of the palatal processes of the superior maxillary and palate bones after rheumatic fever.

Ellen M—, æt. 14, a delicate girl, came under my care at Guy's Hospital, on March 4th, 1867, with some disease of the bone in the roof of her mouth. It had come on seven months previously, after a severe attack of rheumatic fever, in which nearly all her joints were involved. On admission, the whole bones of the part were necrosed, and with a pair of dressing forceps they were readily removed. The two plates of the superior maxillary bones came away, together with the palatal processes of the palate bones. A healthy surface remained. Within one month the parts had granulated up and healed, leaving a large opening into the nose. During the following months this orifice gradually contracted; and I should certainly say that at the present time, October 4th, 1869, it is hardly half its former size. This patient appeared again before me some four or five months subsequently with otitis of the upper part of the right tibia, which passed on to necrosis. I removed a large portion of diseased bone from the leg, and a good recovery followed.

Remarks.—The case of necrosis just related is by no means a common one, for it was undoubtedly associated with the disease generally known as rheumatic fever, in which all the joints were more or less involved. The symmetry of the affection was also very marked, and the rapid recovery of the patient after the removal of the necrosed bone was most satisfactory.

The subsequent contraction of the opening in the roof of the mouth, as months passed by, was well seen, and clearly points

to the wisdom of leaving such cases to natural processes, and not filling the opening with any artificial material. The proper treatment of such a case, so well expressed by Mr. Heath, "is to close the aperture by a projecting fitting plate of metal or vulcanite attached to the teeth, and arching immediately below the palate, but making no pressure upon the edges of the hole itself. The effect of a plug is to enlarge the aperture by absorption."

It may be added, that these remarks are equally applicable to cases of congenital malformation of the palate.

CASE 7.—Necrosis of alveolar process of upper jaw after measles; compensatory growth of lower jaw to make up for loss of alveolar processes in upper.

Sarah S—, æt. 25, came under my care on Sept. 10th, 1868, for some enlargement of the left side of her lower jaw. It had been growing since her infancy, and had not caused her much inconvenience. On examination, the left half of the horizontal ramus of the lower jaw was nearly an inch higher in its vertical measurement than the right. In thickness the two sides seemed identical. The teeth were likewise natural, and when the mouth was closed, no difference was perceptible between the two sides. On looking at the upper jaw on the right side, the teeth and bone were quite natural; but on the left there were no teeth, with the exception of the wisdom molar, nor was there any alveolar process of bone, the vertical projection of the lower jaw exactly filling in the deficiency of the upper.

On inquiry, it was elicited that in infancy this patient had had measles, and that, as a result, the whole alveolar process of the left upper jaw had come away. It was clear that nature had consequently caused increase of growth in the lower jaw to compensate for the loss of substance in the upper.

Remarks.—The case just related is one of unusual interest, not so much on account of the extent of bone that had exfoliated after measles, as for the compensatory action that had taken place in the vertical growth of the lower jaw to make up for the loss of bone in the upper.

The lower jaw had completely filled in the mouth, and the

teeth had been pushed upwards sufficiently to come in contact with the bone corresponding to the alveolar process of the upper jaw. It seemed, indeed, as if the lower jaw had grown upwards for want of the regulating influence of the natural pressure which the teeth of the upper jaw must exert upon the teeth of the lower when in contact with them.

It is a pretty example of compensatory action in nature.

In connection with this case, in which it appears probable that the increase of growth in the lower jaw was due to the want of pressure of the teeth in the upper jaw, which in the normal condition always exists between the teeth, I propose to give an example by way of contrast of an exactly opposite condition; a case of flattening of the front teeth with the alveolus, from the constant, although very slight, pressure which resulted from the presence of a large nævus involving the upper lip.

In the former case, the increase of growth in the lower jaw was due to the absence of pressure by the upper. In the latter case, the alteration in form in both jaws was due to the constant pressure of a lip greatly increased by the existence of a nævus.

The case will be illustrated by a drawing (*vide* Plate I).

CASE 8.—Large nævus involving the upper lip, flattening the front teeth in both jaws from its pressure.

Mary P—, æt. 24, came under my care for treatment in Guy's Hospital, on July 21st, 1868. She was the subject of a congenital nævus, which involved the whole thickness and length of the upper lip. It had grown with her growth, and had never shown any symptoms of natural degeneration. Six years previously she had been in a provincial hospital, where the nævus was injected six times without any good result; indeed, since that time it had increased in size. The whole lip was greatly enlarged on admission, with a spongy nævus, which could be almost completely emptied. On removing the pressure, however, it rapidly refilled. Its nature was apparently more venous than arterial, as it had no pulsation.

The drawing, which is copied from a photograph, well shows the patient's condition on admission (*vide* Plate I, fig. 1).

The teeth were completely flattened, the upper more so than the lower (*vide* Plate I, figs. 3 and 4.)

On July 28th I excised the nævus, dissecting up the skin and some of the mucous membrane lining the lip. Very little bleeding took place, as able assistants compressed the cheeks between their fingers and thumbs. Rapid convalescence followed the operation, and the condition of the patient afterwards was satisfactory (*vide* Plate I, fig. 2).

On necrosis of the intermaxillary bones.

Disease of the intermaxillary bones is not of common occurrence. Nevertheless it occurs. I have three examples of complete, and one of partial, necrosis of these bones. One followed measles, and has been related in the 'Pathological Society's Transactions,' vol. x, and is given here in abstract. The second came on without any assignable cause, the third was clearly the result of an injury, and the fourth appeared at birth.

The details of the cases are as follows :

CASE 9.—M. M—, a child, æt. 3, was brought to me at Guy's Hospital on the 15th of July, 1858, when convalescent from an attack of measles, which she had contracted two months previously. Ulcerations of the gum, and disease of the bone of the upper jaw, followed the exanthem. When I saw the child necrosed bone was at once detected in the median line of the upper jaw, and with a pair of dressing forceps it was removed. The bones were clearly the intermaxillary, in a perfect condition. A good recovery ensued.

The drawings of these bones may be seen in the 'Pathological Society's Transactions,' vol. x.

CASE 10.—*Necrosis of the intermaxillary bones.*

John T—, æt. 40, came under my care at Guy's Hospital on July 13th, 1863, for some affection of his upper jaw. It had been coming on for about six months, with pain and swelling,

the latter having been confined to the gum and jaw, corresponding to the four upper incisor teeth. He had had no illness or injury to account for the disease.

Twenty-three years previously he had had a chancre on his penis, but it was not followed by constitutional syphilis.

When I saw him the bones into which the central incisor teeth were inserted were clearly necrosed, and with a pair of forceps they were readily removed. A rapid recovery followed. The lateral incisors were left in the gum, although they seemed to be only partially connected with bone.

The drawing below well illustrates this case, taken from prep. 590⁷⁵ in Guy's Museum. The sockets for the two central incisor teeth are indicated by the bristles.



The following case may likewise be given as one of necrosis of the intermaxillary bones, for they were the only ones deficient. The disease was clearly the result of an injury.

CASE 11.—Necrosis of alveolar sockets of central upper incisor teeth,—intermaxillary bones.

Walter B—, æt. 4, was brought to me on November 16th, 1866, for disease about the upper jaw. It had appeared after a stab with a knife, which the boy had received one year previously. A wound was produced at the time, which never healed; discharge from the part had been constant. A few days before I saw the boy a piece of bone had come away, which the child had swallowed.

When I saw him there was a large hollow in the centre of the upper alveolar processes, clearly due to bone exfoliation. The piece involved the four central teeth, and apparently the whole thickness of the intermaxillary bones. Nothing beyond keeping the parts clean could be done, and in one month perfect cicatrization had taken place.

When growth was completed artificial teeth were to be put in, but not before.

CASE 12.—*Necrosis of alveolus of upper jaw in an infant.*

On April 19th, 1858, an infant, three months old, was brought to me at Guy's Hospital with the left side of the face and cheek much swollen, the eye closed, and copious purulent discharge from the left nostril. The mother, who was quite healthy, and free from all syphilitic taint, stated, that the day the child was born a slight discharge of matter was noticed from the nostril and mouth, and that it had continued since, gradually becoming more copious. For three weeks the face had been swollen. With a probe introduced into the nostril and downwards towards the gum exposed bone was felt; it was likewise detected from the mouth. On May 31st two pieces of bone were removed by forceps from the mouth, which seemed to be the anterior surface of the alveolar process for one central incisor tooth. As months passed by, the tooth came forwards and was quite loose. On November 1st I had to remove it. A good recovery followed.

From the history it would appear as if the inflammation, which ended in the death of the bone, had commenced *in utero*, for purulent discharge was noticed from the nostril and gum the day after the child's birth. The bone was clearly the alveolar process, which included one central incisor, and was consequently the intermaxillary bone. The disease may therefore have been due to some perversion of nutrition in this bone during its development.

On some cases of necrosis of the bones of the upper and lower jaws.

Amongst my notes I have many examples of necrosis of the jaws in which no definite cause could be assigned for the affection—no fever, no injury. In others some uncertain cause was made out. I have nearly as many cases of necrosis of the upper as of the lower jaw, although it is quite possible examples of the

former may have been recorded when those of the latter have been omitted as being the more common. Still, I cannot but think that authors have been somewhat in error when they assert that necrosis of the upper jaw is a rare affection, for I find that out of 50 examples admitted into Guy's during the period of my surgical registrarship, 19 occurred in the upper jaw, 29 in the lower, and 2 in both. The assertion is probably originally due to Stanley, and other authors have repeated it on his authority. My own notes of cases, taken only when of interest, contain many examples of disease of the upper jaw; some of these I will now relate.

The first example is one of necrosis of the alveolar process of the upper jaw, and exfoliation of the lateral incisor tooth; it occurred in an infant only two weeks old, and is one of interest; it is the youngest subject of necrosis that I have yet seen, although the cause of the disease was probably traumatic. I half suspect the bone died from the injury it sustained in the process of spoon feeding, to which the infant was subjected, for the signs of mischief were confined to the outer projecting margin of the bone, all the other parts being sound.

The fact that the lateral incisor was the tooth that exfoliated is another point worthy of notice, for it points to the conclusion that the intermaxillary bone contains only in itself the central incisor, although it may help to support the lateral one. The last case likewise tends to sustain this view.

CASE 13.—Exfoliation of the left lateral incisor tooth, with necrosed bone, from the upper jaw of an infant who was the subject of harelip.

Flora C—, æt. 2 weeks, a delicate infant, which could not suckle, came under my care at Guy's Hospital on July 26th, 1869, with harelip on the left side, and fissured hard and soft palate; the parts were so wide asunder that the free margins of the bony fissure projected forwards, and the gum covering the alveolar process of the superior maxillary bone, or outer border of the fissure, was so inflamed and ulcerated as to expose the crown of the lateral incisor tooth; this was seen to be projecting from the ulcerated surface of the gum, and was quite loose. I removed this tooth, with two pieces of necrosed bone, and recovery rapidly followed.

The operation for harelip was subsequently performed with complete success.

I propose now to quote some other cases of necrosis of the upper and lower jaws. Examples of disease of the upper will be given first, and then one in which necrosis attacked both; examples of disease of the lower jaw will complete the series.

They occurred in patients of all ages, and attacked every portion of the bones. The body of the upper jaw suffered, with the alveolus; and in the lower jaw the coronoid, and even the articular processes suffered with the symphysis and other parts. Where the articular process was involved and exfoliated, it will be interesting to notice that the movements of the jaw were subsequently recovered; indeed, so perfect were these movements, that were it possible to doubt the nature of the specimen preserved in our museum, and here given in a drawing, it would be excusable.

CASE 14.—Necrosis of alveolar process of right upper jaw.

Eliza H—, æt. 24, came under my care at Guy's on June 6th, 1862, with necrosis of the alveolar process of the right upper jaw. It had been coming on for fifteen months without any assignable cause, the woman having been in good health. A large piece of dead bone was removed, including the alveolar process of three or four teeth. The teeth, which likewise came away, were free from decay, and included the right lateral incisor, canine, and bicuspid. A good recovery followed.

CASE 15.—Necrosis of alveolar process of upper jaw opening antrum from below.

Esther A—, æt. 30, a married woman, the mother of one child, came under my care in October, 1865, for necrosis of the alveolar process of the upper jaw, involving the right incisor teeth with the canine and bicuspid, and the two left incisor teeth, seven teeth in all. It had come on without any assignable cause, as fever or injury. After a few weeks' observation the bone was removed with a pair of forceps, a

large opening being left, exposing the antrum in the upper jaw of the right side. After a time these parts greatly contracted, and the deformity and distress were relieved most effectually by my colleague Mr. Salter, who filled in the opening in the jaw by a plate supplied with teeth.

CASE 16.—*Necrosis of the lower border of the orbit, exposing antrum from above; plastic operation; recovery.*

Eliza F—, æt. 34, came under my care in 1864, with a fistulous opening the size of a silver threepence, below the margin of the right orbit, communicating directly with the antrum. It had existed for nine years, having resulted from necrosis of the superior portion of the upper jaw, which had appeared without any assignable cause. The integument of the cheek was drawn tightly down to the margin of the opening into the bone, and caused much deformity.

I accordingly dissected the soft parts freely from the bone, pared the edges of the integument around the fistulous opening, and stitched them together with a continued suture; good union followed, and complete occlusion of the fistulous opening into the bone, removing the deformity. The patient is now quite well.

CASE 17.—*Exfoliation of alveolar process of left upper jaw with first molar tooth.*

Letitia P—, æt. 30, came under my care on March 19th, 1860, for necrosis of a portion of the alveolar process of the left upper jaw. It had commenced two months previously with pain and swelling, and when suppuration followed the pain was relieved; for about six weeks she had suffered only from some swelling and suppuration into the mouth.

This patient had had no illness previously, toothache, or injury; the disease had come on spontaneously.

When I saw her I found diseased bone, which, with a pair of forceps, was readily removed. The first molar tooth came away with it, and was quite sound. A good recovery followed.

CASE 18.—*Necrosis of alveolar process and palate process of the left upper jaw, exposing antrum.*

Emma P—, æt. 24, a healthy married woman, the mother of three healthy children, came under my care at Guy's Hospital on May 24th, 1869, with necrosis of the alveolar process of the left upper jaw. It had been coming, without any assignable cause, for six months; pain and swelling, which were speedily followed by suppuration, being the early symptoms. The central incisor tooth of the right side, with the left upper incisor teeth and eye tooth, had come away about one month.

When I saw the patient I removed a mass of necrosed bone from the mouth which included the alveolar process of the teeth just mentioned, and a portion of the body of the left maxillary bone, for the antrum was freely exposed to view on its removal. A piece of the palate plate of the left upper jaw subsequently died, and was removed. The patient is still under care.

CASE 19.—*Necrosis of a large portion of the body of the upper jaw, clearly from injury.*

I was consulted in August, 1868, by a Mr. T—, æt. 27, for some suppuration into the mouth below the right upper lip and right nostril. It had existed for four or five months, and had been preceded for several months by a constant, dull, aching pain in the upper jaw, more particularly about the front teeth. Pus escaped into the mouth through the gum surrounding the lateral incisor and eye teeth, likewise into the right nostril; with a probe dead bone could be felt from mouth and nose.

On September 8th I removed the necrosed bone, making an incision beneath the lip, and separating the cheek from the bone; a large mass came away, including the anterior wall of the antrum, lower orbital ridge, and base of nasal process, with the alveolar process; rapid convalescence followed, although an opening into the antrum remained. This was subsequently skilfully filled in with a plate containing teeth by my friend Mr. Salter, and no deformity was visible.

This gentleman remembered having received a severe blow from his gun, prior to the appearance of symptoms.

CASE 20.—*Necrosis of the alveolus of the upper jaw after an injury, with sloughing of the lip and deformity of mouth; recovery after operation.*

Henry P—, æt. 25, came under my care at Guy's Hospital in July, 1868, for some deformity of the mouth, the left angle of which was drawn up to the ala of the nose, and bound down to the gum. From the history of the case it appeared that at the age of thirteen he received a severe kick over the left upper jaw, and that this injury was followed by fever; inflammation of the lip and jaw ensued, which went on to sloughing of the soft parts and exfoliation of bone; the alveolar processes of the left upper jaw, including the incisor, canine, bicuspid, and first molar teeth, having exfoliated, leaving an opening into the front of the left nostril (Plate II, fig. 3). The parts subsequently healed, although with much contraction, the mouth assuming a very oblique direction, the corner commencing at the ala, and being bound down to the gum (Plate II, fig. 1).

By an operation the lip was freed from its attachments to the gum, and brought down to the proper level with the mouth, greatly improving the appearance of the patient, and Mr. Salter skilfully filled in the deficiency in the gums and fixed in some artificial teeth. In October, 1869, this man came before me, well pleased with the improvement (Plate II, fig. 2).

CASE 21.—*Necrosis of the facial surface with part of the nasal process of the right upper jaw.*

Hugh N—, æt. 7, came under my care at Guy's Hospital on April 6th, 1863, with necrosis of some portion of the right upper jaw. The disease commenced three months previously as a swelling in the cheek, below the orbit, and within one month an abscess formed and broke externally through the cheek, and also into the mouth. These openings had been discharging ever since. With a probe necrosed bone was readily felt both ways, and by a small incision within the mouth a large piece of the facial surface of the upper jaw was removed, with a portion of the nasal process. A good recovery rapidly followed this operation, and no disfigurement.

CASE 22.—*Necrosis of malar bone and alveolar process of upper jaw.*

Caroline C—, æt. 17, came under my care at Guy's Hospital on March 15th, 1867, for disease of the right malar bone. It had been coming on for six months with swelling and pain, an abscess having burst and discharged beneath the external angle of the eye three months before. At the same time there was swelling and inflammation about the alveolar process of the right upper jaw. The affection had appeared without any distinct cause, for the child had been apparently in good health.

On examination it was clear that necrosed bone was present both in the jaw and malar bones. On March 22nd a large piece was removed from the upper jaw, involving the alveolar process of the right incisors, and on the 27th a large piece was removed from the malar bone. On April 1st another small piece came away, and in a month the child was well.

CASE 23.—*Necrosis of alveolar process of upper and lower jaw.*

John D—, æt. 40, an engineer, who had never had syphilis or taken half a dozen doses of medicine in his life, applied to me at Guy's Hospital, on April 11th, 1867, for some disease of the jaws. It had been coming on for four months, without any known cause, with pain and swelling in the alveolar processes of the anterior halves of both upper and lower jaws, involving the teeth anterior to the molars. Suppuration also existed from many sinuses, and the teeth had fallen out. A piece of bone had come away from the right upper jaw one week previously, and I removed a similar piece from the left lower jaw on April 18th, this piece involving the bony sockets of the incisor and bicuspid teeth. On April 25th I removed a precisely similar piece of bone in two portions from the lower jaw. A good recovery took place in about six weeks.

CASE 24.—*Exfoliation of alveolar process of lower jaw with temporary molar teeth; exposure of permanent teeth.*

James H—, æt. 5, came under my care on July 25th, 1864, with necrosis of the alveolar process of the left side

of the lower jaw. It had been coming for three or four months, without any assignable cause. The child had not had any pain or toothache. With a pair of forceps the bone was removed containing the temporary teeth, which were sound, and beneath the sequestrum the crowns of the permanent teeth were clearly seen; they were loose and seemed likely to exfoliate. For three months I saw this boy at intervals, and these teeth gradually became firmer.

CASE 25.—Acute necrosis of symphysis of lower jaw.

Benjamin G—, æt. 26, a healthy labourer, came under my care on August 20th, 1868, with a large swelling of the chin and an abscess below the jaw, discharging ten days. It had come on rapidly one month ago, without any assignable cause. The jaw-bone was at this time clearly diseased, for dead bone was felt; with a pair of forceps a piece of the horizontal ramus of the jaw close to the symphysis was removed. It was about one inch square, and involved the whole thickness of the bone. A rapid recovery followed.

CASE 26.—Necrosis of the symphysis of the lower jaw and horizontal rami after salivation.

G. B—, a labourer, æt. 31, came under my care at Guy's Hospital, on October 15th, 1857, with necrosis of the lower jaw. He had always enjoyed good health till eight years previously, when he had a chancre, and was profusely salivated. He remained well for three years, when pain first appeared in the lower jaw, upon the left side, and this pain was experienced at intervals for five years, when swelling appeared. For about three months this enlargement continued to increase, and an abscess formed beneath his chin. He then sought advice at a London hospital, where he had seven teeth removed. He remained there for several weeks, and left on October 14th. On the 15th he came to me with all the parts about the chin greatly swollen, and a fistulous opening below the jaw. On looking into the mouth a large mass of necrosed bone was seen resting in a bed of new bone. The sequestrum seemed to be quite loose. With a pair of dressing forceps this was removed without.

difficulty, and was found to consist of the symphysis and horizontal rami as far as the molar teeth, both mental foramina being included. Sensation in the chin was natural.

CASE 27.—*Necrosis of the angle of the lower jaw, with one inch of both horizontal and ascending rami.*

Catherine S—, æt. 28, came under my care in February, 1869, with suppuration about the angle of the lower jaw on the left side. Several fistulous openings existed through the integument, and likewise many into the mouth. All her double teeth had been extracted on that side from her lower jaw, on account of the pain she had had in the part, but she was not sure that the teeth were bad. All then in the mouth were good.

The disease had commenced four months previously with some pain and swelling, with constitutional disturbance, but without any known cause. In July, 1869, or nine months after the first appearance of disease, a piece of bone exfoliated from the mouth, and was evidently the angle of the jaw, with the whole thickness of bone, including one inch and a half of the horizontal ramus and one inch of the ascending; it included, likewise, the groove and canal of the dental nerve.

On October 25th, 1869, repair was perfect, nothing but absence of teeth indicating the extent of past disease.

CASE 28.—*Necrosis of symphysis and horizontal rami of the lower jaw after syphilis and mercury.*

William C—, æt. 31, came under my care at Guy's Hospital in July, 1860, with necrosis of the symphysis of the lower jaw. It had been coming on for some months, and the bone was lying loose in a cavity surrounded by new bone; it was readily removed with a pair of forceps, and was found to be the symphysis, with about one inch of the horizontal ramus on either side, as far as the mental foramina.

Two months later the left horizontal ramus was removed in the same way, and a good recovery followed.

This man had had syphilis ten years previously, and had been salivated.

Remarks.—On perusing the preceding cases of necrosis of the upper and lower jaws, the most prominent point that attracts attention is the entire absence of any satisfactory cause for the complaint, for in nearly all it will be seen that there was no disease in the teeth involved with the necrosed bone, nor any history of injury. In some, however, such a history was obtained. The disease, indeed, appeared in many to be what we must call idiopathic, having sprung up without any assignable cause. In one case syphilis was put down as the cause, and the man had been salivated, and from salivation necrosis of the jaw is not infrequent. In Preparation 1091 of our museum is a specimen of necrosis attributed to this cause; it consists of two thirds of the alveolar process of the lower jaw which became necrosed after the use of mercury for the cure of an ovarian dropsy. The preparation was given by the late Mr. Aston Key.

On necrosis of the condyloid process of the lower jaw and disease of the articulation.

Disease of the bone entering into the temporo-maxillary articulation and disease of the articulation cannot well be divided, for although the joint may be diseased without the bone being involved to any extent, it is clearly impossible for the bone to be much affected without some affection of the joint taking place as a consequence.

Happily, however, disease of this joint is comparatively rare. I have the notes of one case before me in which ankylosis ensued, and for which no operation would be allowed. In our museum (Prep. 1070) there is also a specimen of complete synostosis of this articulation.

I have likewise another case of necrosis and exfoliation of the condyloid process of bone, which I am now about to relate, and in which the movements of the jaw were perfectly restored. Such cases are very rare, but in this the recovery was very marked. I give, likewise, a drawing of the bone.

CASE 29.—*Disease of the temporo-maxillary articulation.*

Emma H—, æt. 34, a married woman, came under my care on May 24th, 1860, for a disease involving the left temporo-maxillary articulation.

It had existed for nine years, and had come on with pain and swelling; for six years there had been a constant discharge from several sinuses, both into the mouth and externally, and the jaw had been gradually becoming fixed; for two months she had been quite unable to move the joint.

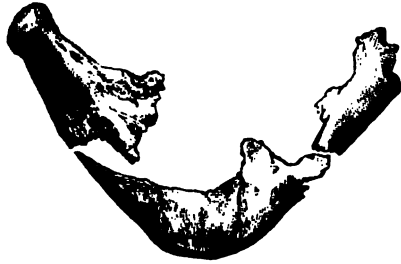
When I saw her the jaw was quite fixed; even with the patient under the influence of chloroform no movement could be made out. Two sinuses existed below the zygoma, leading down to the joint and to what seemed like dead bone. There was much thickening about the articulation, but no signs of disease in other parts.

I wanted this patient to enter the hospital to have something done, but she refused, so I saw nothing more of her.

CASE 30.—*Necrosis of the articular process, ascending and part of horizontal ramus of lower jaw; recovery, with perfect movement of the articulation.*

Caroline C—, æt. 6, came under my care at Guy's Hospital in April, 1868, for some disease about the right side of the lower jaw. It had appeared two years previously as an abscess, without any injury or fever, and was followed by disease of the bone. Several small pieces had come away. When seen the whole of the right side of the jaw and face was much enlarged. Sinuses existed, leading down to diseased bone, four below the angle, and others within the mouth. The disease appeared to be very extensive. There was some movement in the part. On May 12th the openings below the jaw were enlarged, and a large piece of bone taken away, including the articular process and part of the ascending ramus. A second large piece of bone was also removed through the mouth, representing the horizontal ramus. By July 9th all suppuration had ceased, and the child could move the jaw as well as if the part had never been destroyed.

The woodcut illustrates the portions of bone that were removed.



The repair in this case was very remarkable ; it is probable that if the disease had attacked a patient of a greater age the result would not have been so fortunate.

On the treatment of necrosis.

When dead bone can be made out to exist, either in the upper or lower jaw, there is but one form of practice which ought to be entertained, and that is, its removal. It should be removed, also, with as little disturbance to the soft parts, or to the new bone-forming tissues, such as the periosteum, as possible. And it should likewise be removed from the mouth. When this latter practice is impossible or impolitic, from any cause, the surgeon should take good care that his incisions are made where they will be subsequently little seen.

With these principles of practice in the surgeon's mind, there will rarely be much difficulty in adapting the practice to the wants of the individual case.

In necrosis of the upper jaw the bone can always probably be removed by means of incisions made *beneath* the cheek ; an incision *through* the cheek never seems necessary.

In necrosis of the lower jaw, where incisions through the integument are demanded, they should be made below its lower border.

When the bone is fixed, or, rather, before it has been thrown off from its attachments, any operative interference

must be condemned; any attempt at its removal under such circumstances must necessarily fail, or can only be partially successful. Under these circumstances the surgeon should content himself with seeing that all pent-up pus has free vent, by making free incisions through the gum; that the patient's mouth is kept as clean as possible by frequent washings, and that his general condition is kept up by means of tonic medicines and nutritious diet.

When the necrosis is confined to the alveolus, in which the temporary teeth are involved, great care should be taken that the parts beneath are not disturbed, and that the permanent teeth are not interfered with. Even when exposed they need not of necessity come away; indeed, as a rule, they subsequently tighten and become of service.

In young cases, where much loss of bone has taken place, it seems desirable to have some artificial substitute to prevent the occurrence of such a compensatory growth of bone as took place in Case 7.

PART II.

TUMOURS OF THE UPPER AND LOWER JAWS.

On some cases of cystic disease of the antrum.

Diseases of the antrum, or of the cavity which exists in the body of the upper jaw, are by no means infrequent, and when they occur they give rise to symptoms of a somewhat characteristic nature. Many are, there is little doubt, connected with irregular dentition. How many is not yet positively determined; for although it is well known that cysts of the antrum and tumours are constantly found to contain, or, perhaps, to originate about, some tooth which is taking an abnormal direction, pathologists have not yet determined how many cysts or tumours depend upon such a cause. Cysts having this association are described as *dentigerous cysts*, but it is an open question whether many others ought not to be classified under the same heading. Any cases, therefore, that tend to illustrate this subject are read with interest, and with this feeling the following cases have been taken from my note-book.

I propose to quote three cases of so-called simple cysts of the antrum, of what was formerly described as "hydrops antri," or dropsy of the antrum, although it is clear that such a term is not pathologically correct. It was originally given probably from the fact that the expansion of the antrum was, as a rule, the only clinical symptom which attracted notice; the term had no pathological signification.

In the three cases I am about to detail the painless and gradual appearance of the tumour was noted in all, in none was there any history or appearance of diseased teeth, and in all advice was sought simply on account of the disfigurement produced by the disease.

In one case the fluid drawn off was mucoid, in the second two ounces of a dark blood-stained fluid containing cholesterine were drawn off, and in the third two ounces of blood-stained, limpid, albuminous fluid were taken away.

The antrum in each instance was opened beneath the cheek.

In all a cure was obtained through these means, suppuration of the cavity having been set up by plugging it with lint.

CASE 31.—Cyst in upper jaw; recovery after puncture with scalpel and suppuration of cyst.

Eliza R—, æt. 23, came under my hands on June 18th, 1864, on the advice of Dr. Wise, of Plumstead, with a swelling in the right upper jaw. It was as large as a walnut, and had been growing five months; it was clearly connected with the antrum. I opened the cyst beneath the cheek with a scalpel above the alveolar process of the bone, and let out a quantity of mucoid fluid. The part was plugged. It re-collected, however, and the cyst was opened again on August 22nd, when a like fluid was evacuated. The cyst was then filled with lint, and free suppuration established; after this it gradually contracted, and on October 30th the woman was quite well. She remained so when last seen, some five months subsequently.

CASE 32.—*Cyst in antrum ; free incision into it ; recovery after suppuration.*

Eliza F—, æt. 40, came under my care on April 28th, 1863, for some disease of the right upper jaw, of one year's growth. The disease showed itself originally by a painless swelling, when seen there was little else to cause notice. The anterior part of the bone was evidently distended, and the symptoms present were clearly due to such a condition. On May 2nd I punctured the part with a trocar and canula beneath the chin, and drew off two ounces of a dark blood-stained fluid containing cholesterine. On May 30th the wound had closed, it was reopened with a knife, and the cavity plugged. Suppuration followed, and by July 12th the parts had resumed their natural appearance. On August 12th convalescence was established.

CASE 33.—*Cyst in antrum, treated by free incision.*

Mary B—, a healthy married woman, æt. 30, came under my care on August 2nd, 1863, with a cyst projecting into the right nostril, causing its partial occlusion, and a projection the size of a walnut involving the right cheek, and the right ala. It had been growing for fourteen years, but only made its appearance beneath the nose for only a few months. It was not attended with much pain, and she sought aid more from the disfigurement than from the distress occasioned by the new growth.

No doubt existing as to the cystic nature of the tumour, it was tapped, and about two ounces of a blood-stained, limbo albuminous fluid were drawn off. The cyst at once collapsed, and the features recovered their natural shape. In a few weeks, however, the fluid had re-collected, the tumour being large as ever. It was again opened beneath the lip by a free incision, and a long strip of lint introduced to excite suppuration. In four days this was removed, as the desired result had been obtained, and the case went on apparently well; but a fresh collection of fluid of a purulent character made its appearance more particularly towards the nostril. This was accordi-

freely opened by a bistoury introduced through the nose, and a rapid convalescence followed.

This patient was seen two months subsequently, when she was quite well.

On a case of dentigerous cyst of the antrum.

In the cases that have been already quoted of cysts of the antrum no misplaced tooth was noticed, consequently it remains an open question whether they had any connection with dentition; they all, moreover, occurred in adults, when dentition was completed. In the following example of cyst of the antrum a tooth was found to be clearly situated in the cyst and growing from the floor of the antrum into its cavity. The drawing that accompanies the case will illustrate its position.

Cases like the above have been already published, some in these 'Reports,' by Mr. Salter, and surgeons now generally recognise the disease. The knowledge of such cases, indeed, in the case about to be related suggested the practice that was followed, and pointed out the propriety of exploring the antrum before removing the bone which seemed to be the subject of the disease. In former times, doubtless, many upper jaws have been removed as a whole for this affection, its true pathology not having been understood.

CASE 34.—Case of dentigerous cyst of the upper jaw; operation and recovery.

(Reported by Mr. ROGERS HARRISON.)

James J—, a healthy boy, æt. 6, came under Mr. Bryant's care at Guy's Hospital, on March 5th, 1868, for some affection of the upper jaw of the left side. It had been gradually coming for three years, and had appeared to follow a blow that he received at that time from a fall against a stone. The gum about the first bicuspid teeth was cut and bled profusely; for some days it was likewise swollen. Since then he had complained occasionally of pain in the part, but this was never severe.

When seen the left upper jaw was much enlarged; it projected forwards beneath the cheek, more particularly towards the nose, although it did not encroach on this cavity; it

bulged downwards likewise, pressing the palate process of the superior maxillary bone into the mouth. It encroached likewise upon the orbit, pressing the eyelid upwards. He had changed some of his teeth, and had cut the central incisors and double-teeth, but not the lateral incisors and canine. Mr. Bryant at this time made an exploratory puncture into the swelling, with the suspicion that it contained fluid, but blood alone escaped.

On June 18th this patient was admitted into the hospital, and on the 27th Mr. Bryant again punctured the swelling, at this time a little serum making its escape.

On July 24th, the patient being under the influence of chloroform, Mr. Bryant made a free opening into the antrum beneath the cheek by means of a sharp, strong knife. He then cut out a piece of bone, the size of that illustrated in the drawing below, and exposed the cavity. Some serous fluid escaped, and, on careful examination, the glistening surface of a tooth was seen projecting from the nasal angle of the cavity, and growing obliquely upwards. With an elevator this was removed, and appeared to be the crown of the left lateral incisor.

The drawing illustrates the position of the tooth in the bone, with the opening made into the cyst for its removal.

The tooth is also shown, of its natural size; and likewise the piece of bone which was taken away from the anterior wall of the cyst to allow of its removal.



A rapid recovery followed the operation, the boy leaving the hospital on August 13th. On October 6th he called on Mr. Bryant, when the face appeared nearly natural.

On a case of cyst in the lower jaw.

Cases such as the one about to be quoted are not nearly so common in practice as are those I have already illustrated. I have had but one example under my care. How far such are due to the irritation of developing or decaying teeth our science has not yet determined. That some are due to it there seems little doubt, for cases are recorded in which teeth have been found in cysts. Yet it seems true, as Mr. Heath has stated, that cysts occur in the lower jaw, apparently without any immediate connection with the teeth.

In the following case all the teeth were sound, even the one that was extracted: and it is given as an example of simple cyst of the lower jaw, unconnected with dentition.

CASE 35.—*Cyst in lower jaw; recovery after the cyst was opened.*

Eliza T—, æt. 20, came under my care at Guy's Hospital on October 26th, 1866, for an enlargement on the right side of the lower jaw, opposite the second molar tooth. It had been coming for two years. The tooth had been removed without any benefit, and was a good one. The cyst was on the outer side of the jaw, and was about the size of half a walnut. It was evidently a bony cyst, but thin. There was constant pain, of a dull nature, in the part. All the teeth appeared to be sound. On October 26th the cyst was opened from the mouth with a stout knife, and a quantity of serous glairy fluid let out. No tooth or other contents could be seen. The cyst was then plugged with lint to excite suppuration. By January 5th, 1867, the report states that the cyst had steadily contracted; and by March 4th the jaw was of the natural size. On the 13th the girl was dismissed cured:

CASE 36.—On June 7th, 1869, I saw a case which appeared to be somewhat similar to the above, but the patient refused to allow any surgical interference. She was a woman, æt. 50.

The cyst, or rather swelling, involved the left ramus of the jaw, which it expanded equably; it had been growing for about a year and a half. The anterior molar tooth, which apparently formed the upper boundary of the cyst, had been removed by a dentist some months back; it had never, however, caused her pain, and the patient stated that it was sound. The other teeth on that side were good. The enlargement of the bone seemed clearly a cystic expansion, and I wanted to lay the whole open, but the patient refused to allow any interference, so I saw no more of her.

I have, however, seen one case of true dentigerous cyst of the lower jaw, which was successfully treated by laying open the cyst and extracting the tooth; it occurred some years ago in the practice of my colleague, Mr. Poland, with whose permission it is now published. The particulars are as follows:

CASE 37.—Dentigerous cyst of lower jaw; operation; recovery.

Mary F—, æt. 26, a native of Rochester, was admitted into Guy's Hospital on August 10th, 1859, for some disease of the right ramus of the lower jaw. It had been coming gradually for two years, and appeared as a dilatation of the bone, more particularly involving the outer wall. It had never caused much pain.

The outline of the growth was smooth, and it was diagnosed as being one of a cystic nature. Mr. Poland, into whose hands the case came for treatment, laid the cyst open within the mouth, excising a portion of its wall, and evacuated its contents, which were serous. He then discovered a tooth lying at the bottom of the cyst. This he extracted, and a good recovery followed. Mr. Poland tells me that the subsequent progress of the case was most satisfactory.

On the treatment of cystic disease of the jaws.

Our improved knowledge of the pathology of these cystic diseases of the upper or lower jaw (whether simple cystic, or dentigerous) has taught us one practical lesson—that in every case in which the faintest suspicion exists of the cystic nature of the growth, operative interference should be confined

to an exploratory operation, before the graver one of the extirpation of the growth is entertained. By the adoption of this principle of practice, many jaw-bones have, within the last few years, been saved, and as many patients suffering from cystic disease of the jaws have been relieved of their deformity by a simple operation.

In each of the cases which have been recorded, it will have been observed that the treatment was very simple, for a free incision into the cyst was made in all; the subsequent cure being effected by the production of inflammation of the cyst-wall by means of plugging its cavity with lint; although in the case of true dentigerous cyst the removal of the tooth through a free opening into the antrum was likewise needed.

The opening in all the cases of disease of the upper jaw was made through the wall of the cyst, beneath the cheek, and not by perforating the socket of the first molar tooth after its removal, as is often advised. The opening at this spot can be made more easily, and may be made larger, and is more under observation. It should always be a free one. When the cyst is large, a piece of bone may be taken away, as was done in the instance quoted of dentigerous cyst.

Let it be remembered, therefore, that in all cases of a suspected cystic disease of the jaw, an exploratory operation should be made into the cyst before the removal of the bone is attempted; and in all examples of cystic disease, let the opening into the cyst be a free one.

PART III.

ON SOLID TUMOURS CONNECTED WITH THE JAWS.

Diseases of the jaws have always been subjects of interest, and tumours of these parts have ever received marked professional attention; for to the patient they not only cause much disfigurement, but interfere with the important function of mastication, and thus threaten life; and from the surgeon they demand in their treatment diagnostic as well as practical skill of no mean order.

It may likewise be positively asserted that few classes of cases have benefited more by an improved pathology than

those we are now about to consider; and, as a result, a simpler and more satisfactory form of practice is now called into requisition than is to be found in the annals of an older surgery.

It is not my intention in these pages to enter fully into the whole subject of tumours of the jaws. Mr. Heath, in his admirable 'Jacksonian Prize Essay,' has already done this in a way which has left nothing to be desired. I propose simply to give such cases as have passed under my care during the last few years, with remarks, believing them to be worthy of a place in these 'Reports.'

The first case is one of what must probably be called hyperostosis of the bones of the face, more particularly of the upper jaws. It apparently began in the right upper jaw, first occluded the right nostril at an earlier period than the left, although the expansion of the cheeks seemed to have been tolerably equal. The cavity of each antrum was clearly involved, for the symmetrical bulging of the growth at the mouth and cheeks was very remarkable, and the equal pressure upon the globes of the eye was well seen.

The disease seemed to have been attended with little or no pain, and no cause could be assigned for its appearance. The man confessed that he came to me simply on account of the disfigurement it caused.

No operation could be entertained when I saw the man, although I told him to let me watch the case, with the feeling that the time might come when it would be right to interfere.

CASE 38.—Hyperostosis, or symmetrical osseous tumour expanding nostrils and upper jaws, &c.

William W—, a smith, æt. 43, came under my care on February 4th, 1869, for some disease about his face. He had been coming for about twelve years, and showed itself by an expansion of the left nostril, at its upper part; one twelvemonth the same condition appeared in the right nostril, and it was at this time that the left became completely occluded. The expansion of the nose had gone on slowly, and when he came under care both nostrils were completely occluded, and much expanded. The tumour or tumours

downwards, causing a marked bulging into the mouth of the palatine plates of both upper jaws. These bones likewise appeared to be much expanded towards the cheeks. The eyeballs were somewhat pushed outwards. The sight was, however, good. The man suffered no pain, and only from the disfigurement, which was very great. (*Vide* woodcut below.)



On a case of non-malignant tumour of the upper jaw.

In the following example of simple non-malignant tumour of the upper jaw, the course and treatment of the disease are fairly illustrated. The slow growth of the tumour, its long duration before surgical advice was sought, and the absence of all other than simply mechanical symptoms, make up the usual history of such cases. In the case about to be recorded the tumour was made up of fibre tissue, cartilage, and bone cells; these three elements, in different degrees of quantity, building up the bulk of tumours of the upper jaw.

With respect to the treatment of the case no doubt could be entertained, the extirpation of the growth being the only justifiable operation.

The success of the treatment was most satisfactory, and in

this also the case quoted followed the usual course of all such cases, for there are few large operations in surgery that are followed with such good success as these, rapid recovery being the rule after operative interference.

CASE 39.—Case of osteochondroma of upper jaw. Excision and recovery.

(Reported by Mr. F. C. TURNER.)

Thomas W—, æt. 35, a builder, came under Mr. Bryant's care at Guy's Hospital on May 1st, 1869, having been sent up to him by Mr. Whiting, of Southend, Essex. The patient was a well-made, healthy-looking man; he had always enjoyed good health, although from boyhood he had suffered from his teeth. He had had many large gumboils and abscesses on both sides of his face, the scars of the latter being still visible, more particularly on the left side. He had not, however, suffered much for the last few years, since he had allowed his whiskers to grow.

He first noticed the disease of his right upper jaw twelve years before his admission. He discovered it accidentally in a looking-glass. The tumour was then about the size of a small walnut, and was situated on the palate process of the right superior maxillary bone near to the alveolar process. It was then quite hard and painless. Since that time the tumour has grown gradually, but has given him little inconvenience. It has been gradually, however, encroaching on the cheek.

In November, 1868, his right eye became affected, the tears from that eye coursing down the cheek. The parts about the eye also became swollen and inflamed. At Christmas an abscess formed at the inner corner of the eye, opened and discharged, the swelling subsiding; since that time, however, several attacks of inflammation and suppuration have appeared in this part, and disappeared. The patient has never had any pain in the tumour, and suffers only from the mechanical inconvenience of the growth.

Condition on admission.—To the eye the right cheek was clearly much enlarged from a tumour situated in the upper jaw. The skin over it was healthy, except at the inner corner of the right eye, where there were signs of inflammation and suppu—

ration, apparently from obstruction to the lachrymal duct. On looking into the mouth an extensive tumour was seen with a smooth surface, starting from the central incisor tooth and middle line of the hard palate, and involving all the teeth; the first molar was completely surrounded. The tumour pressed backwards to the edge of the hard palate, and posteriorly appeared to pass the middle line. Externally the tumour seemed to involve the whole upper jaw outwards to a point just below the malar bone, and upwards to the lower border of the orbit near to the inner canthus. The tumour felt very hard and bony.

Mr. Bryant determined, with the patient's sanction, to remove the growth.

On May 4th the operation was performed, the patient being under the influence of chloroform. The upper lip was first slit up in the middle line with a bistoury, and an incision made above the ala of the nose and up the cheek to the inner canthus. The cheek flap was then dissected upwards and turned out, the surface of the tumour being exposed. The vessels that were divided were twisted, and all bleeding ceased. Mr. Bryant then divided the right upper jaw from its attachment to its fellow with a small saw, the incisor tooth having been previously removed, and divided, likewise the malar and nasal processes of the same bone. The tumour was next seized with a pair of bone forceps and readily broken off, the whole mass fortunately breaking away from the orbital plate, which was left *in situ*, as was likewise the palate process of the palate bone. With a pair of scissors the soft parts in the palate were divided, and the whole growth removed.

The edges of the lip and cheek were then carefully adjusted, and stitched together.

Some slight hæmorrhage followed the next night, and some chloroform sickness; but on the second day these symptoms had passed away. The wound looked well, and the man was able to take plenty of liquid nourishment.

On May 6th the sutures were removed, the wound having united, a piece of strapping being applied to guard against separation.

On May 10th the man got up for a short time, and the wound had firmly cicatrised. There was only a little discharge from the mouth. No tears had rolled over the cheek

since the operation; Mr. Bryant, however, advised the man to apply pressure daily with the finger to the lachrymal sac.

May 17th.—Everything doing well. Patient gets up and goes about.

May 24th.—The patient can swallow his food now readily. Wound looks very healthy.

He left the hospital convalescent.

October 20th.—This patient has had an artificial palate and set of teeth fitted in by Mr. Salter, and is in all respects, both in appearance and comfort, well pleased with the result of his case. His face is quite natural, and he speaks as clearly as any other man. (*Vide* Plate III, fig. 2.)

The growth is figured in Plate IV. A reference to its microscopical appearances will be found in the description of the plate drawn up by my colleague Dr. Moxon.

We meet, however, occasionally with tumours of the upper jaw that require less severe measures than the removal of the bone;—the removal of the growth from the bone, or with that portion of bone with which it is connected, being generally sufficient. Indeed, looking at the subject in the broadest way, it is never necessary to do more than remove the tumour with that portion of bone upon which it is placed. In some cases, as in the one already given, it is necessary to take away a large portion of the upper jaw; in other cases much less severe operations will be found to suffice.

In one I am about to quote the tumour sprang from the nasal plate of the superior maxilla. The removal of this plate with the growth was all that was required. In a second, a fibrous growth pressed into the antrum, and the simple enucleation of the tumour was all that was needed.

In some cases, again, the laying open of the antrum and enucleation of the growth is the right practice, especially in cases of polypus of this part.

In all cases, however, it is the surgeon's duty to take away as little of healthy tissue as possible; he is to take away all the disease, and only such healthy bone as may be found necessary to further this end. To Sir William Fergusson is undoubtedly due the establishment of this rule, and it is one that all surgeons should strive to follow.

CASE 40.—Fibroplastic tumour growing from the nasal process of superior maxillary bone ; removal and recovery.

A healthy man, æt. 42, came under my care at Guy's Hospital in March, 1863, with a tumour expanding the left nostril and cheek. It had been observed only three months, and had been detected after a severe attack of epistaxis, which had lasted for one week. The tumour nearly filled the nostril and completely closed the passage. The man's general health was good, and there was no glandular enlargement. On April 21st I excised the growth, the man being under the influence of chloroform. An incision was made commencing from the corner of the eye through the nostril, which was divided and turned up. The growth was then seen to spring from the nasal process of the superior maxillary bone. This was divided with a pair of bone forceps, and the tumour turned out. An excellent recovery followed, and in August, 1869, more than six years after the operation, the man was well.

The tumour was clearly, on examination, one of the fibroplastic kind.

CASE 41.—Epulis of left upper jaw pressing into antrum ; removal and recovery.

Mary A. H—, æt. 24, came under my care on Sept. 5th, 1860, for a growth the size of a large walnut connected with the gum of the left upper jaw. It had been growing for eight months ; had commenced without known cause about the bicuspid teeth ; had increased without causing much pain, and was distressing only from mechanical causes. The teeth of the jaw were sound and perfect.

I removed the mass with a scalpel, and on lifting it out of its bed found it had pressed backwards into the antrum, which it had partially filled. A good recovery followed, although with a large opening into the superior maxillary bone.

The tumour under the microscope seemed to be made up of fibre tissue only.

CASE 42.—*Tumour growing from the palate process of the superior maxillary bone ; excision ; recovery.*—*Myxoma.*

Miss Mary C—, a governess, æt. 25, consulted me on January 28th, 1868, for some tumour of her upper jaw. She was sent up to me by Mr. Oswald Foster, of Hitchin, under whose care she had been.

She was a healthy young woman, and had never had any serious illness. Her present disease appeared about six years previously, with an abscess about the first molar tooth of her left upper jaw. In 1864 another so-called abscess appeared in the same part, which discharged and healed, and again in 1865; the abscess at this time being larger than on either of the previous occasions, and leaving more swelling behind it. Since the appearance of the first abscess, however, in 1862, there had always been some enlargement about the palate.

When I saw this patient the whole of the hard palate on the left side was covered with an elevated, hard fibrous growth; it had a smooth surface, and was elevated about a third of an inch. It involved the alveolar processes and teeth of the entire jaw, and was not painful to the touch. No operation but its removal could be entertained.

On July 3rd this patient was admitted into Guy's Hospital, and on July 11th an operation was performed. The patient was placed under the influence of chloroform, and her mouth fixed open by means of Mr. Thomas Smith's admirable gag. The growth was then completely scraped off the palate surface of the hard palate, all bleeding being arrested by the actual cautery.

No bleeding or bad symptom followed the operation; the patient being convalescent on July 22nd, when she left the hospital.

This lady called on me in August, 1869, quite well. On looking into her mouth no signs of any operation could be made out.

Microscopically the tumour was of the glandular or myxomatous kind.

CASE 43.—Tumour of hard palate towards its posterior border (apparently polycystic).

On May 10th, 1869, Mary R—, a healthy woman, æt. 54, came under my care, at Guy's Hospital, for a growth that had been coming for fifteen years, springing from and involving the posterior portion of the hard palate of the left side. It was the size of a walnut, and had an irregular bossy outline. It appeared to be made up of cysts, some being translucent. One or two of them I punctured, a clear tenacious fluid escaping mixed with blood.

The growth gave her no pain, and very little inconvenience, as it did not encroach on any important part to any extent.

It had been so gradual that I did not suggest any operative interference until some necessity should arise. When I last saw her in September she was much the same.

The disease was evidently of a simple nature, for it had existed for fifteen years, and appeared to be of a polycystic kind.

On a case of cancer of the upper jaw.

Cancerous affections of the upper jaw are too common. Mr. Heath has tabulated 138 cases of cancer out of 307 of tumours of this bone. The soft cancer is the one usually met with, examples of carcinoma fibrosum being very rare. The disease is said also to begin usually in the antrum.

I have two cases to relate of this affection, one of which occurred in a young woman aged 29, in whom the disease had progressed so far as to forbid surgical interference. In the second an operation was performed, when the disease was found to have been connected with a malplaced tooth in the body of the bone.

The cases are as follows:—

CASE 44.—Growth (malignant?), occupying right upper jaw, causing blindness, with protrusion of eye-balls, occlusion of nostril, and inability to open mouth, &c.

Julia P—, a young married woman, æt. 29, the mother of

two children, came under my care at Guy's Hospital on February 18th, 1864, with a frightful disease of the face. It began six years previously by an enlargement of the *right* upper jaw, which was soon followed by complete occlusion of the right upper nostril, and protrusion of the right eye. The glands, also, below the jaw, on the right side, at this time became enlarged. These symptoms gradually increased, till the tumour became of an enormous size, projecting like a coconut in the face, and both eyes were completely pushed out of their orbits, and all sight was lost. The mouth became fixed, from the encroachment of the tumour upon the articulation of the lower jaw, and the gradual enlargement of the glands beneath it, so that deglutition was a work of difficulty, and respiration was interfered with. The woman had lost flesh rapidly, and was clearly sinking.

Nothing could be done for her, as she refused to enter Guy's. I never saw her more than once.

I must give one more case to conclude this series, for it was a case that made a great impression on my mind when it passed under my care, and from it a valuable lesson is to be learnt. It was one of enlargement and expansion of the horizontal ramus of the lower jaw. The enlargement put on all the appearance of a new growth, for it was unattended by any of the symptoms of inflammation, although it had been preceded by them, and even by necrosis of some portion of the jaw. It turned out, however, eventually to be an enlargement due to a chronic inflammation of the bone and abscess.

That such an inflammatory growth might have been excised as a tumour of a more serious nature excited a feeling far from pleasurable, and the having escaped such a serious piece of bad surgery, by a little care, was a lesson in favour of a cautious practice, which ought not to be lost, for had the operation not been undertaken more with a view to explore than excise the growth, the lower jaw of this patient might have been removed.

The details of the case are as follows :

CASE 45.—*Cystic expansion of the lower jaw simulating a tumour, due to inflammation and necrosis of the bone.*

(Reported by the late Mr. LEONARD CASS, an old and valued pupil.)

Mary D—, æt. 19, was admitted into Guy's Hospital on

June 7th, 1860, under the care of Mr. Bryant, with an enlargement of the right side of the lower jaw, involving the whole of the horizontal ramus. It appeared from the history of the case that she had a fall three years previously, and struck her chin against a chair; swelling of the part rapidly appeared, and pain involving the three front lower teeth; an abscess also subsequently formed and broke. The teeth were extracted, and a large piece of black bone came away from the mouth; several other pieces were subsequently removed, and she was well in about one year. She remained free from all apparent disease for six months, when a swelling appeared in the right horizontal ramus of the lower jaw, and this has steadily increased.

When she was admitted there was a large globular swelling situated in the right ramus of the lower jaw; it had a smooth outline, and clearly involved the whole thickness of the bone, nearly as much expansion of the bone existing on its inner side as on its outer. The tumour was very firm, and hard pressure upon it caused pain. It had been coming for one year and a half.

The nature of the case was not very clear. Mr. Bryant half suspected it to be inflammatory, and yet the uniform expansion of the whole bone rather indicated some new growth. An exploratory operation was consequently advised, and performed on June 19th. Chloroform was given, and a free incision made along the lower border of the tumour beneath the jaw; in this the facial artery was divided and tied. The soft parts were then dissected off the bony swelling, and about the attachment of the masseter muscle a small opening, large enough to admit a probe, was found, which communicated directly with a cavity in the centre of the jaw. This opening in the bone was consequently enlarged, and a small piece of necrosed bone found, resting in a cavity which was lined with false membrane; this was removed and the parts closed. From this time everything went on most satisfactorily; the wound rapidly closed, and the expanded cyst in the bone contracted; the jaw recovered in six months its natural size and its normal functions.

On a case of solid tumour of the antrum, apparently originating from the irritation of a tooth.

The following case, which I attended with my colleague Mr. Bader and Dr. Alfred Charlton in 1868, is worth record from the fact that the growth apparently originated from the irritation of one of the double teeth; the tooth was clearly imbedded in its base, and the tumour sprang from a ridge growing from the palate process of the superior maxillary bone surrounding the tooth.

CASE 46.

The early history of the case I give in my colleague Bader's, own words.

"Violet C—, æt. 8½, the youngest of six children, came on November 6th, 1867, with slight protrusion of the eye. This was observed first three months ago; it increased since. The retinal veins showed impeded blood-return through the ophthalmic vein; they were gorged; the eye and sight otherwise healthy. About three weeks later an elastic swelling appeared above the left lachrymal sac. This grew larger, displacing the eye more; the sight then began to fail.

"An incision was made over the most prominent part of the swelling, and a large quantity of a grey red gelatinous substance removed from behind the eyeball and from the left antrum; there was little bleeding. The wound healed kindly, the protrusion subsided, vision improved. About two months later the protrusion reappeared, the sight failing again."

It was under these circumstances that I was consulted. On March 1st, 1868, I saw the child with Mr. Bader and Dr. Charlton. The disease at that time was apparently connected with the left upper jaw, the growth filling up the nostril and pressing up the eye; it pressed the cheek likewise upwards, but had in no way altered the shape of the hard palate.

The child's health was tolerably good. An operation was determined upon, and on March the 4th it was performed. Mr. Bader kindly gave chloroform, and Dr. Charlton assisted.

sed the tumour by an incision made along the border of
ose and lower margin of the orbit, and turned the cheek

I then freely opened the antrum with a pair of forceps,
ith my finger detected the base of the tumour growing
the upper surface of the palate process of the upper maxil-
lone. The whole bone was consequently removed without
difficulty. The operation was attended with very little
ng.

e child passed a quiet night, having slept and taken
ishment well, but twenty-four hours after the operation it
convulsion and died.

examining the bones that had been removed, it was clear
he disease had sprung from the upper surface of the
process of the upper jaw, and from a rough ridge of bone
inding the posterior double tooth. The tooth at its lower
e had partially cut through the gum and showed as a
speck, but it was imbedded in the centre of the base of
ew growth. The growth had expanded the antrum and
d into the nose and orbit, having caused absorption of
of the bone.

fortunately, no microscopical examination of the growth
ade. It was, however, of a greyish semi-transparent
lar character, and readily broke down under the finger.

not appear to be of a cancerous nature, it having no

e main interest of the case rests in the fact that it ap-
l to have originated around the base of a double tooth.
a case suggests the probability that other solid tumours
ave a like origin and indicates the important line of
e that should be followed, viz., the exploration of the
n, even in cases of solid growth, before the removal of
per jaw.

DESCRIPTION OF PLATES I, II, III, IV,

To illustrate Mr. Bryant's Paper on Diseases of the Jaws.

Plate I illustrates a case of nævus of the upper lip, flattening the front teeth from its pressure. (Case 8.)

Fig. 1.—Shows the patient's condition on admission.

Fig. 2.—Shows her condition after the operation.

Figs. 3, 4.—Show the flattening of the upper and lower teeth respectively.

Plate II illustrates the case of Henry P—. (Case 20.)

Fig. 1.—Shows the deformity of the mouth before the operation.

Fig. 2.—Shows the man's appearance after the operation.

Fig. 3.—Shows the deficiency in the bone, after exfoliation.

Plate III illustrates a case of osteochondroma of the upper jaw. (Case 39.)

Fig. 1.—Shows the condition of the patient on admission.

Fig. 2.—Shows the result of the operation.

Plate IV illustrates the naked-eye and microscopical appearances of the tumour in the same case.

Figs. 1 and 2.—Show different aspects of the tumour.

Figs. 3 and 4.—Show the appearances seen at different parts of the same section, which have been separated simply for convenience. They are viewed with 1.5th objective.

- a. The fibrous substance of the tumour; the fibres had a close texture, with cells imbedded in it. The cells were without capsules, and very delicate in outline.
- b. The bony part of the tumour, containing bone-lacunæ with canaliculi (c), but of coarse and imperfect formation.
- d. A capillary vessel, coursing through the fibrous substance of the tumour.

Plate 1.

Fig. 3.



Fig. 2.



M. & N. Harbort, imm.

Fig. 1.



Fig. 4.



Ormsat, Nish



Plate II

Fig. 2



M & N Hanhart imp

Fig. 3



Fig. 1.



W. Hurel lith



Plate III.

Fig. 1.



Fig. 2.



1



Plate IV



Fig. 2.



Fig. 1.



Fig. 4.





ON THE PROCESSES
FOR
DETECTING BLOOD IN MEDICO-LEGAL
CASES.

By ALFRED S. TAYLOR, M.D., F.R.S.

IN a recent volume of these 'Reports' I published a short paper on Van Deen's process for the detection of blood in medico-legal cases, by the employment of the peroxide of hydrogen and the freshly precipitated resin of guaiacum.¹ Van Deen was the first to recommend the use of ozonized oil of turpentine in admixture with guaiacum. Dr. John Day, of Geelong, Australia, improved on this method, by employing what is termed ozonized or ozonic ether; but he has clearly proved that this liquid, like the ozonized oil of turpentine, owes its properties to positive oxygen or antozone. In my experiments I made use of a watery solution of peroxide of hydrogen.

The mode of employing the peroxide was fully described in the paper above referred to. I have had occasion to make use of this process in many cases since that date, and have found that under proper precautions the results are most satisfactory. The colouring matter of blood could be detected in cases in which the microscope and the ordinary means of research failed to show its presence. In most of these cases the results were corroborated by the use of the spectral microscope.

I have found, however, that there is some difficulty in obtaining a pure aqueous solution of peroxide of hydrogen of uniform strength and of good keeping qualities. The solution

¹ See 'Guy's Hospital Reports' for 1867, ser. 3, vol. xiii, p. 431.

is commonly acid, from the presence of hydrochloric or sulphuric acid, and this acid affects the precipitated resin. These objections do not exist in reference to the ethereal solution of the peroxide acid as acetic ether. This is free from any impurity, and in a cool place it may be kept unchanged in a closely stopped bottle for any length of time. In employing it the ether rapidly evaporates, and leaves the pure peroxide in a state to produce the reaction. It is therefore preferable to the aqueous solution as it is commonly met with. The ozonized oil of turpentine is not so well fitted for use as the ethereal or aqueous solution.

In my former paper I briefly referred to Mr. Sorby's spectroscopic process, and made a general comparison of these two modern methods of detecting blood for the purposes of pathology and legal medicine. Mr. Sorby's mode of applying the spectroscope was not described, and the subject was therefore left incomplete. At my request Mr. Sorby has drawn up a concise account of the method which he adopts for the application of the spectroscope to these investigations.

I subjoin Mr. Sorby's description of the process in his own language. It is so clearly given, that no medical practitioner can meet with any difficulty in employing it in cases which may come before him.

ON THE DETECTION OF BLOOD BY MEANS OF THE SPECTRUM-MICROSCOPE.¹

By H. C. SORBY, F.R.S., &c.

In applying the spectrum test to the detection of blood-stains, the method of examination must, to some extent, depend on the amount of material at command. If there be not too little, a small portion of the stained fabric should be soaked in a few drops of water in a watch glass, the liquid squeezed out, allowed to stand a short time in the glass, so as to deposit any insoluble matter, and then poured into one of the small, deep cells used in examining the spectrum. These cells should be made from

¹ For general directions in using the spectrum microscope, I beg to refer to an article in Dr. Lionel Beale's 'How to work with the Microscope,' 4th edition, 1866, p. 218.

barometer tubing, having an internal diameter of one eighth or one tenth of an inch, and should be one half or three quarters of an inch long; one end being fastened to a piece of plate glass, like an ordinary cell for mounting objects in liquids. If the stain had been recently made, the spectrum of fresh blood would then be seen, which has two well-defined absorption bands in the green.¹ If, however, the blood had been exposed some time to the action of the air, these bands would be fainter, and another would be seen in the red. The relative distinctness of this shows the amount of change, and is some indication of the age of the stain; but in forming any such conclusion, it is necessary to know the circumstances of the case, since the sulphurous acid met with in towns or in rooms where gas is burned produces more change in a day than purer air does in a week. If, however, little or no change had occurred in a town, it would be good evidence of the stain having been recently made.

In order to make the detection of blood still more certain, it is well to observe the effects of reagents, and examine other spectra. A piece of citric acid, about one fiftieth of an inch in diameter, should therefore be dissolved in the liquid in the cell, when it will be seen that the absorption bands of the fresh blood gradually disappear, and are not restored by the subsequent addition of excess of ammonia. This is a most important fact, since it shows that the acid produces a permanent change, which is not the case in nearly all other red colouring matters. To remove all doubt about the presence of blood, a very small piece of sulphate of protoxide of iron, not above 1-100th of an inch in diameter, should be added to the cell, care being taken to ensure the presence of excess of ammonia, and to avoid as much as possible oxidization by exposure to the air. It is therefore well not to stir up the liquid, but having previously rather more than filled the cell, to cover it with a small piece of thin glass, and after removing excess of liquid by blotting-paper, to fasten down the glass by putting round it a little gold size. If enough citric acid, and not too much sulphate of iron have been added, the protoxide of iron may be made to dissolve by turning the cell upside and downside, over

¹ For representations of the various spectra referred to, see my paper in the 'Quarterly Journal of Science' for April, 1866, vol. ii, p. 198.

and over again; or by keeping it for a time upside down, if the oxide has adhered to the bottom. By this means the hæmatin is slowly deoxidized, and the well-marked absorption band of deoxidized hæmatin gradually makes its appearance in the green, with a second, fainter band nearer the blue end. If the solution be at all turbid, the cell should be kept horizontal for a time, so that the insoluble matter may be deposited on the side. The production of such a remarkable and characteristic spectrum by the addition of sulphate of iron, as far as I am aware, only occurs in the case of blood, and therefore affords very conclusive evidence of the presence of that substance. With proper care these various results may be seen to perfection with about 1-100th grain of blood, but I need scarcely say that before any one attempts to apply the test in any important case, he should try the experiments with a little undoubted blood, so that he may be familiar with the various spectra, and quite certain that he understands all the requisite manipulations. In all cases the spectra of a suspected stain should be compared, side by side, with those of blood, in order to see that there is a perfect agreement; and, of course, in all these experiments the solutions must be diluted to such an extent as to show the spectra in a proper manner.

It may, however, often happen that the suspected stain may contain so little colouring matter that it would be essential to examine it without any loss. Since exposure to the air may make the stain only partially soluble in water—and if it had been previously washed nothing but such insoluble matter might be left—the stained fabric should be digested in a few drops of water in which the small piece of citric acid had been already dissolved, and the excess of ammonia afterwards added, before the liquid is introduced into the cell. The spectrum should then be examined before and after deoxidization by sulphate of iron. With proper care good evidence of the presence of blood may thus be obtained from an extremely faint stain, since 1-1000th of a grain of blood suffices to show a decidedly characteristic spectrum.

The above methods apply to stains on cloth, silk, linen, and calico; and I need scarcely say that it is desirable to ascertain whether any important amount of colour is dissolved from unstained portions. In the case of stains on leather, or any substance containing tannic acid, special precautions are requisite,

since it precipitates the colouring matter of the blood, which, therefore, might not be detected, even though present in considerable quantity. If the stain be on leather, a thin shaving should be cut off from the surface, so as to have as much blood and as little leather as possible, and the blood should be dissolved off without exposing the solution to the action of the leather itself. This may be accomplished by taking one of the experiment-cells, nearly filled with water, bending the shaving, and inserting it into the upper part of the tube, so as to touch the water, being careful to arrange it so that the stain may be on the convex side of the leather, and in contact with the water. When a drop of blood falls on leather, many of the red globules are filtered out from the serum, and left on the surface; and when thus treated they dissolve, and the coloured solution sinks at once to the bottom of the cell, without coming in contact with the leather. If, however, the stain had been previously sponged or washed, it might, perhaps, be impossible to detect blood by the spectrum method.

For detecting blood in urine, it is best to use a tube of thick glass ten inches long, and a quarter of an inch in internal diameter, permanently closed at one end with a circular piece of plate glass, and, when filled, covered over at the other end with another glass. If the urine be at all turbid, it should be filtered; but, since most of the red globules would also be separated, the precipitate on the filter should be washed with a little water, and the solution examined by itself, or added to the filtered urine. If the depth of colour in the ten-inch tube be so great that the yellow end of the green part of the spectrum is absorbed by the urine, it must be somewhat diluted, or examined in a shorter tube. In the case of urine of average depth of colour, I find that as little as $\frac{1}{10000}$ th part of blood can easily be detected, which is equivalent to about one drop in a pint.

In conclusion, I must say, that in examining some thousands of spectra, I have been led more and more firmly to believe that with anything like reasonable care there is no difficulty in obtaining satisfactory proof of the *presence or absence of blood*. I do not at present see any probability of deciding by the spectra from *what kind of animal* it came; but of course the mere fact of its presence or absence may be of very great importance in connection with other evidence.

ON

“TETANY,” OR REMITTENT TETANUS.

By W. MOXON, M.D.

IN January of this year my attention was arrested by the peculiar symptoms which were present in a little boy among my out-patients at Guy's. These symptoms were so remarkable that I think an account of them may be interesting, as I believe they would have puzzled a little any one who met with the disease for the first time. I will at once describe the case shortly.

The patient was a little boy, *æt.* 3 years and 5 months, very backward, unable to talk, using only two or three words; one of a family of eleven, of whom five were still-born, one died aged six months of hooping-cough, and another at two years of cholera, leaving four alive at present. The mother says that all the children who survived birth had what she calls “inward fits.” One little girl had fits “outwardly” when she was attacked with measles, though the measles were not severe; and a boy, who now is twelve years old, had fits “outwardly” while teething. The same boy now is subject to “spasmodic asthma.” Her children were all late in teething, generally it was the eleventh or twelfth month with them before a tooth appeared. They were all restless and fidgety when nursed. Her husband is a carman—a steady man. They always have had plenty to eat. She is no blood-relation to her husband. None of their relatives have been insane, or have had fits after infancy. Her husband's brother has had rheumatic fever four times.

My little patient first had an attack of the disorder in question when he was five months old. The mother says that the child then was taken with difficulty of breathing, the breath being, she says, "heavy, hard, and short, as if he had inflammation on the chest." At the same time the backs of the hands swelled, and the hands and feet were cramped. The child was put into a warm bath and recovered. The second attack occurred at twelve months. On this occasion the first thing noticed was a turning in of the thumbs across the palms, and what the mother calls a "huffing up" of the backs of the hands, which were turned forwards by extreme pronation of the forearms. Since then the child had a third and fourth attack like the second, at intervals of about five months. The fourth attack was more severe, and the breathing was much embarrassed, and attended with croupy sounds. The hands were very much contracted, so that the child for some days could not grasp at anything. On this occasion the child attended at Guy's, but was not seen in the attack, which was called spasmodic croup.

The last attack, in which I saw the child, was sudden, like the rest. The child was seized with contraction of the hands, and breathed hard, and, as the mother says, he started at the least noise, "so you would think he would start out of his bed." And he grew so stiff that the mother could not bend him, and he cried all night. He had pain in the hands, which were dry and hot; and when the mother tried to open them the child cried much. He never was sick, but always appeared sick, as if something rose in his throat. He did not cough in the attack, but had difficult breathing; he swallowed oddly, as if he were choked. The child is habitually very costive, going for four or five days, and with difficulty moved with medicine. I saw him while the spasm was on, and, shortly stated, this was his condition. A little child, with rickety enlargements of the ends of the ribs and of the wrist and ankle bones. The child was fretful and cried when any attempt was made to touch it. It sat up in its mother's arms, with its arms half flexed, and its hands strongly pronated and half flexed at the wrists; the thumbs were bent across the palms and adducted, and the fingers semi-flexed and clustered over the thumbs, so that the backs of the hands only were

offered to view. The hands were further swollen, and the dorsal veins distended with blood; any attempt to examine them caused the child such pain that we could not persist with it. The feet were in a corresponding condition; the great toes flexed and adducted, and the other toes flexed and gathered towards them. The child was quite sensible—indeed, sharply alive to the risk of being handled, so that there was no approaching him. It had then no difficulty, nor any unnatural sound in breathing. There was no swelling of any other parts than the wrists and ankles. There was no pyrexia.

In this case I believe we have a disease whose peculiarities are so marked that it is convenient to distinguish it by a special name.

In our ordinary text-books I do not find such a disease noticed—thus, Dr. Radcliffe, in his contribution to ‘Russell Reynolds’ System of Medicine,’ “On Diseases of the Spinal Cord,” does not describe an intermittent form of tetanic spasm, although he goes fully into the varieties of spinal disease usually recognised. Dr. West, in his ‘Diseases of Children,’ treats of infantile trismus, and of inflammatory diseases of the spinal cord, but not of such partial tetanic spasms as those before us. Romberg, in his ‘Diseases of the Nervous System,’ does not describe any such affection. He uses the term “*rheumatic tetanus*,” which would well apply to such a case as mine; but he uses that term to signify an idiopathic tetanus, which differs from traumatic tetanus only in the absence of a wound as its cause. Neither Aitken, nor, as far as I am aware, any other English systematic writer on diseases, mentions this. Nor, finally, has it a place among the 1600 odd diseases of the new nosology of the Royal College of Physicians. Hence it appears that this disease has not drawn much attention in this country. But in France it has been well described. Trousseau, in his ‘Clinical Medicine,’ devotes a chapter to its description, adopting the name “*tetany*,” which was given to the spasm by Lucien Corvisart in 1852. I was much pleased to find how well the account of the former admirable describer and teacher corresponded to the symptoms which my case presented. One of his cases, that of a child twenty-one months old, further resembled mine in this, that the child had other forms of convulsion besides the tetany, especially that spasm of the glottis was

associated with the attacks, which were attended with swelling of the hands and feet. The choice of the name *tetany*, although it is well adapted to a disease which much resembles tetanus, yet I think is unfortunate in that the recurrence of the attacks, which is an important feature in the disease, does not appear in the name as it does in the title "*intermittent tetanus*," which the first describer of the spasms (Dance, 1831) gave to them. Trousseau makes his account of the disease include a somewhat wide range of affections. His division of the cases into mild, medium, and severe, is a very useful practical distinction for therapeutical purposes. It corresponds to that used by Dr. Barlow in the case of rheumatic fever, and is capable of large application. Such a division is like in effect to the plan which horticulturists have of dividing plants into hardy, half-hardy, and stove plants,—a simple expedient that has done much for the art of gardening. The division of cases of any disease into mild, half-mild, and severe, is as little scientific as that I mention of plants is botanic; but for management of diseases and discussion of therapeutics, it is very useful. Trousseau's severe form, however, does not appear to me to differ from idiopathic tetanus as generally understood. I will extract his account of the case by which he illustrates it.

"Elizabeth B—, aged 28, was admitted January 20th, 1848, into St. Mary's Ward, No. 32. She was in the eighth month of pregnancy, and was suffering from syphilis, with numerous ulcerated mucous tubercles on the external organs of generation. She had, besides, a very copious and obstinate diarrhœa. She was in a state of considerable weakness and marasmus, and on February 13th she was delivered of a still-born child. Two slight contractions of the uterus, which were scarcely perceived, were sufficient to expel the fœtus. The diarrhœa ceased at last, on the administration of nitrate of silver injections; it was completely arrested five days after delivery. The appetite became good again, all the digestive functions regular, and a marked improvement of the general condition of the patient was observed from day to day. She has even regained her strength and a certain amount of flesh, when she was seized, on February 27th, with symptoms which terminated fatally.

She complained in the morning of some swelling in the feet,

and expressed a fear that she might be again paralysed, as she had been on a former occasion. She added, however, that she felt well, and, indeed, apart from this slight swelling of the lower limbs, nothing was found which called attention. On the following night she had a violent pain in the head, and the next morning she was seized with tetany.

"Her hands and feet were violently convulsed, and her fingers and toes semiflexed, in the attitude which I need not again describe. The muscles were so contracted that all efforts to overcome their resistance proved useless. The muscles of the feet were involved, the jaws were convulsively clenched, and speech was embarrassed. The patient, however, still answered the questions that were put to her, and her intellect was perfect; as the muscles of the neck and chest shared in this general convulsion, respiration was impeded, and the face red and congested.

"It was then ascertained that the patient since her delivery, and even when her diarrhoea had scarcely stopped, had, on several occasions, got out of bed during the night and fetched water from the fountain in the hospital yard. On the night of February 27th she again committed the same imprudence, and it was after this that the symptoms, which were already imminent the preceding day, manifested themselves with awful violence.

"She looked on the point of choking, and cerebral congestion was also to be dreaded. She was immediately bled from the arm, but four hours afterwards Dr. Blondeau was sent for; the contractions had diminished in the limbs, but the symptoms had become worse in regard to respiration. The muscles of the neck and face were more violently contracted than in the morning; the livid face, the fixed eyes, the anxious breathing (which had already become stertorous,) the uncountable pulse pointed to asphyxia carried to the highest degree, and to imminent death; and yet in the midst of this storm the patient seemed to retain her consciousness. Twelve leeches were ordered to be applied behind the ears, but two or three had scarcely taken before the patient died.

"On making a post-mortem examination, all the viscera were examined with the greatest care, and no other appreciable material lesion was found than traces of congestion in the

meninges, the veins of which contained a little more dark blood than usual."

This case I cannot see as differing from common tetanus. It was a first attack, and the jaws and neck were affected severely from the commencement.

On the other hand the mild and half-severe cases which present the character of intermittent, or rather recurrent, tetanic spasms of the extremities, as in my case, appear to me to form a very well-marked and distinct disease. A point of chief interest, which has not drawn attention hitherto, is the likeness of intermittent tetanus to those remarkable convulsive disorders which have occurred epidemically from the use of ergoted rye, and are called *Raphania*, *Ergotism*, or *Morbus Epidemicus Convulsivus*. The resemblance of these spasms will be seen if I extract from Romberg's work his account of the ergot convulsions. He says: "The hands and feet are attacked by cramps of the flexor muscles; the fingers of both hands are bent like hooks, the thumbs being pushed under the fore and middle fingers in an oblique direction; the wrist is strongly curved inwards, so that the hands assume the shape of eagles' beaks; the toes are doubled under the sole of the foot." These spasms he describes as going on to the production of tetanus and trismus. There is no loss of consciousness, but when the disease becomes more violent the convulsions put on an epileptic form, and delirium or dementia supervene. The description of the ergot cramps in their moderate form then, might almost serve to describe the spasm of intermittent tetanus in my case, and in such cases. However I cannot make out that the child has eaten rye bread, yet I think it is not the least interesting feature of this disease that its spasms should thus have so close a resemblance to the remarkable and peculiar spasms caused by ergot when used as an article of diet. The duration of the milder attacks of ergotism last about three weeks; the spasms keep their severity about four days.

The progress of my case was satisfactory enough; in four days the cramps passed off, but for some time after the veins of the hand were large, and the mother said the hands puffed up occasionally. I treated him with five-grain doses of the bromide of potassium dissolved and sweetened, and since the ner-

vous symptoms ceased, he has been taking iron wine and cod liver oil, and is getting stronger.

As to differential diagnosis, it is possible that such a complaint might be thought to be spinal meningitis; but I will not contrast the symptoms of this disease with those of tetany, believing that it will be enough to bear in mind, in cases of spinal spasms in children, the possibility of their being examples of this comparatively innocent disease.

Besides the well-marked and characteristic example of tetany or remittent tetanus which I have here detailed, I have met with four other examples of the disease among my out-patients, one in a child of about the same age, and the other three in female adolescents. In all these cases the intermittent spasms, with the curious form of the contracted hand, made the affection so peculiar that it was a satisfaction which I think others under similar circumstances would seek, to be able to refer the disease to a known and described kind.

ON
THE TORSION OF ARTERIES;

A

DESCRIPTION OF SOME MODELS, MADE TO ILLUSTRATE THE EFFECTS OF TORSION;
WITH REMARKS.

By THOMAS BRYANT.

THE torsion of arteries as a means of arresting hæmorrhage has made such progress in the practice of surgery since it was reintroduced to our notice by a brief note from Professor Syme in the 'Lancet' of January 4th, 1868, and at our own hospital has met with so much support, even to the suppression of acupuncture, that it becomes a matter of considerable importance for all surgeons to understand the physiological process by which the simple twisting of a vessel can prevent the flow of blood from its extremity, as well as the means by which the twisting of the vessel may be effected in the most certain manner.

It is not, however, my intention on the present occasion to enter at any length into these questions, for a full detail of the physiological means by which hæmorrhage from a twisted vessel is arrested will be found in a paper of mine which was read before the Medical and Chirurgical Society on June 9th, 1868, and published in their 'Transactions' of that year. In it the results of a series of experiments on the horse and dog during life, and observations on the effects of torsion upon arteries of the human subject during life and after death, are carefully detailed, the experiments having been commenced on February 4th, 1868, and continued for many months.

Similar investigations were subsequently made by Dr.

Humphry, of Cambridge, and brought before the profession in an able paper which was read before the British Medical Association at Oxford in August of the same year, and published in the 'Journal' of the Association on January 2nd, 1869. I had the pleasure of hearing Dr. Humphry's communication, and it was gratifying to find that, upon the whole, his results went to support my own. In a single point of practice we were found to differ, but of that hereafter.

During last winter and summer my own investigations have been continued, and, I may say, they have gone to prove the entire accuracy of the conclusions I had previously arrived at. A suggestion, however, from our well-known modeller, Mr. Towne, led me to inject with wax some vessels of the human subject that had been twisted after death, in order that I might enable him to display in a more permanent and efficient manner than could otherwise be done the varied physiological effects of torsion on the vessels.

For this purpose I removed from a large number of subjects the lower portion of the abdominal aorta with the common, external, and internal, iliac vessels, and having twisted the ends freely, although not off, had them filled with a vermilion-coloured wax injection. These were then dropped into a jar of glycerine and water, and careful sections of the preparations were subsequently made with a sharp scalpel as they were required. From these sections Mr. Towne has made some admirable models, which display in a perfect way most, if not all, of the modes in which hæmorrhage from a twisted vessel is arrested. I purpose in these pages to give a brief description of these models, aided by some drawings which have been made by our artist from them, with remarks upon the subject of torsion.

The models are five in number; they have all been made with wonderful precision from sections of the aorta or common iliac vessels which had been twisted and subsequently injected. Each may, therefore, be regarded as a typical illustration of one of the modes by which hæmorrhage is arrested after torsion. Modifications of these different results, doubtless, are found in practice. I have seen very many; but all may be brought down to one or other of the different types now made permanent by Mr. Towne.

In model No. 1 (Fig. 1), we see the most complete and perfect

illustration of the mode by which hæmorrhage is prevented from a vessel that has been subjected to the operation of torsion. At A the external or cellular coat is seen twisted into a knot, through which no injection passed; and at B the inner coat is well displayed fairly divided at the point of torsion of the external coat, and incurved so as to form upon the first rush of blood or injection C a complete valve.


In the model,—where the broad surface of this valve is seen,—the valve is so closed by the force of the injection that no escape took place through it; and it can be well understood how, by the force of the heart's action, the valve thus formed by the incurved inner coat of the vessel would act equally beneficially during life. The greater the force of the blood the more perfect would be the closure of the valve—this valve apparently acting much as the semilunar valves of the heart are known to do.

In model No. 2 (Fig. 2), the valvular incurvation of the divided inner coats (B) and the twisted external coat (A) are well shown, but the valve in this case is not closed, no injection having been employed. It has been introduced here to help to explain Fig. 1, and to render this important physiological process more intelligible.

In model No. 3 (Fig. 3), we see a frequent result of torsion, and a method no less complete than the last by which the flow of blood is arrested in a twisted artery. At A there is the same twisted external coat as we have already seen, and at B the lateral view, if it may be so expressed, of the same divided and incurved middle coat, the valve formed by this middle coat being apparently perfect. But in this case, with the first rush of injection, some small portion passed through the valve before it had completely closed, and at C this portion of injection is seen lying beyond the divided inner tunics of the vessel, and between them and the twisted external coat.

The twisted external coat in this case prevented any escape of blood or injection, supporting most completely the valvular incurvation of the inner tunics.

In model No. 4 (Fig. 4), the same facts are shown as in the last; the broad surface of the valvular incurved inner coat being displayed instead of the lateral or narrow, as in No. 3.

The model represents the same view as No. 1, with the clot  blood or injection which was sent by the first impulse of the injection through the valve before its closure.

Model No. 5 (Fig. 5) was made to illustrate a by no means uncommon effect of torsion upon an artery, which, from a large number of experiments, seems to be the more usual effect of twisting a diseased or atheromatous vessel. The twisted external or cellular coat is shown here as in the other drawings, but the valvular incurvation of the inner coats is not visible, for in this case the inner coats of the vessel seem to have been split up into laminæ, the blood being caught and arrested between the folds of the broken-up and split membrane, hæmorrhage being in this way arrested.

It is to be observed, likewise, that a mass of injection was sent beyond the laminæ of the split inner membrane, and that its escape externally was prevented by the twisted external or cellular coat, as in models Nos. 3 and 4.

With this brief description of the models, as illustrated by the drawings, let us pass on to consider what physiological facts they show, and what conclusions can be drawn from them. The facts seem to be clear and decided.

They show that by the torsion of an artery the inner coats are divided, and in the majority of cases turned inwards, and that in the most perfect examples these incurved coats form complete valves, not unlike the semilunar valves of the heart, on the injection of the vessel, either by the blood of the patient during life, or by artificial injection after death.

They show that in other cases—how many it is difficult to estimate—the valvular incurvation of the divided inner coats is not so perfect as to prevent the passage of a small portion of blood or injection with the first rush of fluid, although it is tolerably clear that the valve is subsequently rapidly closed with any increase or continuance of the injecting force.

They prove, likewise, that in some cases this valvular incurvation of the inner coats is exchanged for a general splitting of the tissues, hæmorrhage being prevented by the clotting of the blood between the irregular laminæ of the divided membrane and the twist of the external cellular coat.

They also prove the great value of the knot formed by the torsion of the external cellular coat; for although in such

instances as are shown in figures 1 and 2 the support of such a twist appears to be of secondary importance—the valvular incurvation of the inner coats being apparently sufficient of itself—no one can doubt its value in such cases as figures 3 and 4 are meant to illustrate. And even if, in a large number of such cases, the valve formed by the divided recurved inner coat proves to be perfect after the first rush of the blood current has taken place, the knot formed by the twisted external coat must prove a valuable support, and in doubtful cases, where an imperfect valve exists, it must be of still greater importance. In figure 5 the presence of the twisted external coat is surely of value, not only by forming an obstacle to the immediate escape of blood through the broken-up inner membrane, but by giving time to allow of complete coagulation of the blood which has been caught between the laminæ of the inner coats.

We come, therefore to this conclusion—that although there is no physiological necessity, in the most complete examples of torsion of an artery, for the preservation of the knot formed by the twisted external coat, there is in the imperfect examples; and as it is impossible for the surgeon to know during life, in any given case, whether the valvular incurvation of the inner coat has taken place in the most complete way or not, and as it is at least probable that an imperfect incurvation of the inner coat exists, it seems to be more prudent for the surgeon to act on the side of caution, and to preserve this twisted external coat in its integrity in all cases.

I look upon the valvular incurvation of the inner coat as the chief means adopted by nature for the arrest of hæmorrhage, and the twist in the external coat as an all-important additional security; the elastic and yet brittle inner tunic, with its tendency to adhesive inflammation, requiring, in all but the most perfect examples, during the first few hours after torsion, the support of the tougher external one.

The more the inner coat is broken up by the twisting of the vessel, the greater is the need of the external coat to give it support.

The more the end of a large artery is twisted, the more is the inner coat broken up and the greater is the danger of disturbing its valvular incurvation.

When the end of a healthy vessel is twisted off, the inner coat is, as a rule, greatly broken; when the end of a diseased vessel is so treated, it is split into fragments.

When a limited number of rotations of the forceps—two, three, or four—are applied to a healthy vessel, the valvular incurvation of the inner tunic is, as a rule, complete; and the more diseased the artery, the fewer are the rotations required.

The propriety of twisting off the end of an artery or leaving it on becomes, therefore, a matter of great importance, and a great practical question which has yet to be decided.

From the remarks I have already made it will be evident that my own opinions tend to support the practice of leaving the twisted extremity of the vessel *in situ*. Dr. Humphry has, however, come to the opposite conclusion. How it is, therefore, that we differ upon this point may claim some brief notice, for his authority is so high that his opinions are readily accepted and his practice followed.

First of all, Dr. Humphry clearly shows in his paper that he does not attach so much importance to the reflection of the inner coat, as a barrier to the flow of blood, as he does to the twisting of the outer coat, forasmuch as by this, he states, "the inner coat is not only forced into, but is held in, its new position; accordingly, if a syringe be attached to an artery thus twisted, and water be injected, considerable resistance to the escape of the water is presented; but if the twisted portion of the outer coat be cut through, or dissected off, the water very soon escapes. It has little difficulty in finding its way through the inner coat, or of separating the surfaces, when the support afforded by the outer coat is withdrawn."

These facts are undoubtedly correct, my own experiments have confirmed them; but the test applied to the inner coat by dissecting off the outer is a very severe one, to say the least of it, and applies to conditions that do not naturally exist. The facts tend, moreover, to prove the value of the twisted external coat rather than the weakness of the inner tunic, and suggest to the surgeon the wisdom of doing nothing to weaken the strength of the twisted external coat. Yet it is to be remarked that Dr. Humphry in most of his experiments twisted off the ends of the vessels, and in doing this, I have little doubt, in a

large number of cases he not only destroyed the valvular incurvation of the inner coat, and so broke up the tissues as to render the support afforded by the external coat an absolute necessity, but by the same act of twisting off he likewise weakened the external coat upon which safety under such circumstances absolutely depended; for repeated experiments have proved to me that when a mixture of glycerine and water of the sp. gr. of blood is thrown into a large artery, the end of which has been twisted off, it is far more frequent to find some leaking of the vessel through the divided extremity than when the end of the vessel has been only twisted three, four, or five revolutions.

When the arteries are diseased this fact comes out still more clearly, for in a diseased artery the inner coat is so brittle as to break and incurve on one or two rotations of the forceps. One or two more rotations break up the inner membrane into pieces very like those seen in Fig. 5, and by twisting the end off the artery it is very apt to be destroyed.

The twisting off of the end of a large artery crushes up the inner membrane, and too often lacerates the external, destroying by one act the valvular incurvation of the inner tunic, upon which the arrest of hæmorrhage so much depends, and weakening the support which the external coat would otherwise give, and which under such circumstances is so much required.

In a recent amputation of the thigh, where the vessels were much diseased, the truth of these remarks was well illustrated, for when I twisted the femoral artery three complete revolutions the end became so loose that I thought it was off, and leakage followed, but when I took the vessel up again, having cut off the lacerated extremity and twisted its end two rotations, good success ensued. This case illustrates the practical truth that in applying torsion to a diseased vessel a more limited number of rotations of the forceps should be made than to a sound artery.

What we want to effect by the torsion of an artery is a laceration and incurvation of the inner tunic, and to support this incurved membrane by the twist of the external coat. We do not want to crush up the inner tunic too much, or to weaken in any way or to lacerate the external. By twisting off the end of the vessel I have abundant evidence that we incur a greater

risk of falling into both of these errors than by making a limited number of rotations of the forceps and leaving the end of the vessel on. All my experiments and observations tend to prove this in a direct way, and the facts that Dr. Humphry has supplied by his experiments go to support the same views.

If it be generally true, therefore, as a modern writer in the last edition of 'Holmes's Surgery' has so dogmatically asserted, "that torsion is unsuitable for diseased arteries, and large vessels, even though healthy, cannot be invariably secured by it Professor Humphry having found in his experiments on animals that the outer coat is sometimes too much weakened by the rotation," he should have added *when rotated off*, for it was made true only from the fact that torsion was carried to too great an extent. For all my experiments and nearly two years experience have convinced me of the following conclusions :

That torsion may be safely applied to all arteries of the extremities and to all those of the trunk which are in size less than or equal to the femoral. To the carotid and iliac vessels it has yet to be applied.

That it is almost as applicable to diseased as to healthy vessels, the former requiring fewer rotations of the forceps than the latter.

That in large healthy vessels, such as the femoral, the extremity should be twisted till resistance has been overcome, but no further—three, four, or five rotations of the forceps being, as a rule, all that is needed. These rotations should be made sharply.

That in large atheromatous vessels the same rule should be applied, two or three rotations of the forceps generally sufficing.

That in all small vessels torsion may be applied very freely, even to the separation of the end, although when evidence of disease exists it is better to proceed with more caution and not to twist off.

That in every case where a large artery is twisted it is advisable to allow a current of blood to flow into the vessel before the forceps are removed from its end. This caution not only tests the completeness of the act in all cases, but in doubtful ones facilitates the coagulation of the blood in the meshes of the broken-up inner membrane.

For nearly two years I have practised torsion upon arteries

and veins of all sizes up to the femoral, and I have seen it practised likewise in all ways. During that period I have never, with one or two exceptions, applied a ligature to a divided artery in an uncomplicated case. No instance of secondary hæmorrhage from a large or small vessel has yet been recorded after its use. I have certainly had more cases of primary union of wounds during this period. Stumps have healed more kindly and wounds have closed more rapidly. I have not seen anything to make me hesitate about the value of the practice, but I have seen much to encourage me in its adoption.

It may require some care in its application, but not more than the taking up of a large vessel, and the application of a ligature to its end with neatness. Any surgeon or dresser who can do the one can do the other, and I am not sure that to the inexpert one mode of arresting hæmorrhage is more difficult than another. In the practice of torsion to such a large artery as the femoral even rough handling has proved successful (as it has before in the application of a ligature); and when torsion succeeds at the time, every hour that passes strengthens the probabilities of success, whereas, in the case of the ligature, such cannot be said to be invariably the fact.

Torsion may, in exceptional cases, be troublesome to perform; in others it may prolong an operation; and in some cases it may even fail to arrest hæmorrhage. But, upon the whole, the adoption of torsion must be looked upon with favour, for it certainly is applicable in the majority of cases, it tends to simplify surgery, to hasten the repair of wounds, to discourage suppuration, and to add to the general safety of our patients. To apply torsion it is only necessary to seize the artery firmly, and to twist it sharply till resistance ceases. Any forceps that hold firmly and do not tear will do; although for large vessels a broad end is required.

At Guy's Hospital, up to the present time, the femoral artery has been twisted at least twenty-two times, the tibial seven, and the brachial three. I have applied torsion in upwards of a hundred cases altogether; no difficulty of any importance has been experienced in any case, and nothing but a good result has yet been recorded. I may add, likewise, that amongst our house-surgeons it is proverbial that since torsion has been employed secondary hæmorrhage after operations has been comparatively of rare occurrence.

DESCRIPTION OF PLATE.

FIG. 1.

- A. Twisted external cellular coat.
- B. Incurved inner coat, showing broad surface of the valve.
- C. Injection representing blood, none of which passed the valve.

FIG. 2.

- A. Twisted external cellular coat.
- B. Incurved inner coat projecting into the vessel, but not by the force of the injection.

FIG. 3.

- A. Twisted external cellular coat.
- B. Incurved inner coat, showing the lateral surface of completely closed.
- C. Injection, some of which passed through the valve.
- D. Injection which passed the valve before it was closed and was retained by the twist in the external coat.

FIG. 4.

Represents the same as Fig. 3, with the broad surface of the valve.

FIG. 5.

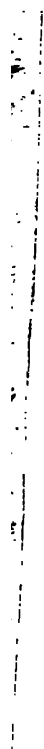
- A. Twisted external cellular coat.
- B. Inner coats split into laminae.
- C. Injection representing blood caught between the laminae.
- D. Injection or clot retained by twist in the cellular coat.
- E. In each figure represents the different varieties of a twisted artery.



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REMARKS ON
CERTAIN CUTANEOUS AFFECTIONS;
WITH CASES.

SCLERIASIS; ICHTHYOSIS; PEMPHIGUS;
RHINODERMA; LICHEN PLANUS; MOLLUSCUM
CONTAGIOSUM; TINEA FAVUS.

By C. HILTON FAGGE, M.D.

IN the present communication I propose to offer a few remarks on certain forms of cutaneous disease, based on observations made in the wards and out-patient department of the hospital in the course of the past two years. The paper may be regarded as a continuation of one which was published in the thirteenth volume of these 'Reports,'—except that, instead of restricting my attention to those affections which are of especial rarity, I shall now refer also to such among the less infrequent diseases of the skin as may have presented points of interest during the period indicated.

I shall not make any attempt to *classify* the diseases enumerated in this paper. For, as it appears to me, nothing has so greatly tended to bring the study of skin diseases into disrepute, and its professors into contempt, as the premature effort to systematise opinions concerning these diseases. The present period is eminently one of *progress* in dermatology. Every year new views are put forth concerning one and another of the recognised cutaneous affections, and new forms of disease are continually being discovered and described. It necessarily follows that any system, however carefully constructed, must, in a short time, be set aside as imperfect or even as erroneous.

Again, this question of classification will never, I think, be

viewed in its true light so long as it is viewed with reference to skin diseases alone, apart from the classification of the diseases of other organs. Who would attempt a perfect classification of affections of the *lungs*, while the relations of tubercle are so ill-defined as they are at present, and the opinions with regard to "fibroid phthisis," "hæmorrhagic phthisis," "bronchial phthisis," are so unsettled? And why should those who endeavour to teach what is known as to cutaneous affections exhaust their strength in the attempt to systematise, at a time when doubts still prevail as to the pathological and the causal relations of some of the most important of these affections?

It may, perhaps, be answered that since skin diseases are visible on the surface of the body it is to be expected that we should have a more complete knowledge of them than of internal maladies. To some extent this reply is a fair one. It is, I think, too much forgotten that the study of cutaneous affections approaches in some respects nearer to post-mortem work than to ordinary clinical observation. The dermatologist has not to deal with the patient's statements, nor even with the finer results of physical investigation, but to note for himself the visible colour and texture of the organ diseased. But there is this important distinction—that whereas the condition of the deeper parts can be inspected only when life has ceased and circulation is suspended, the skin may be watched for days and years together, and every change in the state of its vascular supply attracts and compels notice. It is a familiar fact that many skin diseases scarcely leave any marks of their presence in the dead body. A man may have had a psoriasis or an eczema for years, with intense reddening of the surface; but after death one can hardly distinguish the affected from the unaffected parts. The same may, indeed, be said of all the visible mucous surfaces. Every one that has made a post-mortem examination of a case in which tonsillitis had existed must have been struck with the want of correspondence between the appearances seen during life and those discoverable after death.

Surely a fair corollary from these observations is, that in all probability *internal parts* are likewise subject to conditions of congestion, and even inflammation, which might be evident enough could they be inspected in the living body, but which

are, and will ever be, almost undiscoverable by the morbid anatomist. If a spot on the skin may for years be reddened and scaly, with great pain and itching, and yet after death the affected part be scarcely discoverable on superficial observation, why should not different parts of the mucous membrane of the stomach, defined patches of the pleura, or particular portions of the liver or lung, be liable to congestions equally persistent, and equally beyond the detection of the morbid anatomist? Who can say that such changes may not exist, to account for various long-continued pains and aches; such as, for instance, the pain in the left side from which so many women suffer?

In making these remarks, however, I do not mean to advocate the adoption without proof of such a theory as I have suggested to account for unexplained pains or other symptoms. My object is to carry out the comparison already hinted at between "dermatology" and "morbid anatomy," and to show that the scope of the former is *far wider* than that of the latter. Complaints are often heard of the complexity of skin diseases, and of the needless multiplication of names and varieties in this as compared with other branches of medicine. Far be it from me to say that these complaints have not been in past times, and are not to some extent still, well founded. But it is surely a valid answer that this complexity of skin diseases is in great part inevitable, arising as it does from the fact that in the skin certain changes are obvious which in the internal organs remain undiscovered (on the assumption that such changes may occur in these organs), and thus that symptoms can be at once referred to their pathological causes in the former instance which in the latter are as yet unexplained.

With these preliminary remarks, I pass on to consider separately some of the forms of cutaneous disease.

SCLERIASIS.

In the 'Guy's Hospital Reports' for 1867 (ser. iii, vol. xiii, p. 255) will be found a paper on "Keloid, Scleriasis, Morphœa, and some allied Affections." In this paper my main object was to establish two points, both of which were opposed to the received views on the subject—first, that the disease known as Addison's keloid, so far from being incurable and inevitably

entailing great deformity of the parts affected by it, tends to subside spontaneously, and generally leaves the skin soft and healthy, or merely discoloured; and, secondly, that this disease, so far from having any relation to true leprosy, is intimately connected with a complaint of a very different character, first described by Thirial, under the name of "*sclérème des adultes*," and known generally as scleroma, scleriasis, or sclerodermia. I proposed, therefore, that both these affections should be included under one name, that of Thirial being distinguished as "acute," that of Addison as "chronic," scleriasis.

Since that time some further opportunities have presented themselves to me of studying these forms of disease, with the result of confirming my previous convictions as to the points mentioned above. But it now appears to me that it would be better to designate the two forms respectively as "diffused" and "circumscribed," than as "acute" and "chronic," since the duration even of the more transitory variety is very much longer than that of any disease ordinarily termed "acute."

Of the affection described by Thirial—*diffused scleriasis*, as I would term it—I could find no recorded instance in English literature two years ago. I was only able to refer to brief notes of one or two cases which had been seen by Dr. Gull. Since that time two well-marked examples have been under my care in the hospital. The first of these was shown at a meeting of the Pathological Society in the course of last session, and an account of it has been published in the 'Transactions.'¹ I shall, therefore, give only brief notes of it here.

CASE 1.—*Diffused Scleriasis.*

(Reported by Mr. R. RENDLE.)

E. B.—æt. 40, admitted into the clinical ward under Dr. Fagge, May 27th, 1868. Three or four months previously she had first experienced a stiffness in the nape of the neck, and this rapidly extended. On admission the skin of the neck, back, chest, arms and face, was hard and baconsy. It seemed to be adherent to the subjacent tissues, so that it could neither be moved on them nor taken up in a fold between the fingers. The induration began posteriorly at the occipital bone above, and reached downwards as low as the sacrum, passing gradually into a normal condition on each side, in the direction of a line drawn from the lower ribs to the coccyx. In front it passed upwards to the sides of the face and forehead. It extended downwards over the whole chest, ceasing rather abruptly along a line

¹ Vol. xx, p. 403.

drawn from one side to the other between the cartilages of the ninth ribs. The colour of the skin was darker brown than natural, especially on the face and neck. There was a marked want of expression in the face, and she could not open her mouth to the full extent. The eyelids were unaffected. The tongue was free. Over the breasts the induration ceased abruptly at the margin of the areola of each nipple, which could consequently be pressed inwards by the finger, forming a cup-like hollow with a sharp border. The disease extended down the arms as far as the wrists. It also involved the lower limbs in a slight degree.

The affected parts did not pit in the least, even on continued pressure. The temperature, taken most carefully, was 97·8. Accurate observation failed to make out any decided impairment of sensation, although the patient herself said that the sensibility of the surface was altered in character, and perhaps slightly diminished. The sweat was acid, and its secretion appeared to take place naturally. The urine was repeatedly examined, always with negative results.

She remained in the hospital until August 14th, 1868. During a great part of the intervening period she had warm baths every day, or even twice a day; and from these she appeared to derive some benefit. She took chiefly cod-liver oil and quinine. Before she was discharged from the ward the induration was slightly diminishing.

From that time to the present (November 15th, 1869) I have never lost sight of this patient. There has been a steady, but very slow, progress towards recovery, and during the last few weeks this has gone on more rapidly. There is now a very decided diminution in the hardness of all the parts affected by the disease. The colour has also become more natural. The complexion is now fair, instead of having the peculiar brown tint which once characterised it, and which was very marked in the crow's-feet under the eyes. The face is resuming its expressiveness, and the features seem to be regaining their individual stamp. She has continued to take the quinine, and has employed occasional baths.

The second case is strikingly similar.

CASE 2.—*Diffused Scleriosis.*

(From the report made by the Ward Clerk, Mr. GRAYSON.)

"A. D., æt. 63, came to Guy's Hospital as an out-patient under Dr. Fagge's care in the autumn of 1869, and was subsequently admitted into Mary Ward under Dr. Wilks. She lives at Hackney. She is married, but has had no children, nor any miscarriages. She belongs to a healthy family, and has always had good health. For some months past she has observed a stiffness of the back of her neck. This was first discovered by her husband six months ago; it was attributed to rheumatism, and but little notice was taken of it. The stiff and hardened state of the skin, however, gradually spread to the shoulders, and she consulted a surgeon at Hackney about it, who advised her to use hot-water fomentations, which she did with some relief.

"On admission she looks a much younger woman than she really is, this being probably due to the sleek, shining appearance of her face, which has none of the furrows of age, but is (on the contrary) smoother than natural, and presents a fulness usually seen only in younger women. The integument of the cheeks and forehead is markedly indurated; it cannot be pinched up in a fold. She is unable to open

her mouth to its full extent. The skin of the eyelids, however, is nearly or quite as soft as natural. Her complexion is peculiar, but difficult to describe. The cheeks have some colour, but the face generally is of a yellow-brown hue—not sallow, but rather of a warm brown tint. Beneath the eyelids the “crow’s-feet” of dark brown pigment are very marked. In some way she resembles the woman who was under Dr. Pagge’s care with the same complaint last year, so that when she walked into the out-patient room he mistook her at the first glance for his former patient.

“The induration is more extreme at the back of the neck, where it first began, than anywhere else. It reaches down the back, as low as the loins, and has no definite limit in this direction. It passes forwards over the throat, across the clavicles, and down over the chest and abdomen, terminating about the umbilicus. It extends down the upper limbs to the wrists, gradually diminishing in degree. The lower extremities appear to be entirely free from it.

“The disease thus presents all the characters of a diffused scleriosis; but in front of each elbow there is a peculiar hard band, which differs from anything usually described in this disease. The bands on the two sides are nearly symmetrical, each lying over the corresponding supinator longus. The left one is the more developed of the two. When the elbow is extended this band becomes tight and prominent, looks very like a scar that might have been produced by injury, and feels as if there were a mass of hard material in the subcutaneous tissue, as well as in the skin. But when the joint is flexed it is found that the induration is seated wholly in the skin itself. The band is narrowest just opposite the elbow, and spreads out above. Over its centre the cuticle is brown and roughened, and divided by cross furrows into little squares, just as is seen in ichthyosis; at the upper part of the band its surface is quite smooth, and has a yellow waxy look, very like that of the disease known as ‘Addison’s keloid.’

“The band over the right elbow is less developed; its cuticle is beginning to become affected in the manner above described, transverse stræ being plainly visible on its surface.

“There are two other regions in which the cuticle presents an appearance similar to that seen in ichthyosis—at the nape of the neck, where there are two patches of this kind, one on either side of the median line; and in the axilla, just within the posterior fold.

“It ought, perhaps, to be added that she had a severe injury of the right elbow-joint some years ago, which led to a permanent impairment of its movements; but there is no reason to suppose that this has had anything to do with the band in front of this joint. She is, however, positive that the one over the *left* elbow was set up by a scratch twelve months ago. She says she frequently rubs the cuticle down with pumice, until it is on the same level as the rest of the skin; but that it always grows again and becomes rough.

“She says that she now perspires very little.

“The sp. gr. of the urine is 1022, it contains neither albumen nor sugar.

“She appears perfectly well in all respects, with the exception of the scleriosis.”

She was ordered to have an alkaline bath every morning, and as she was able to obtain such baths at home she left the hospital at her own request on October 15th.

She has since been attending as an out-patient. When last seen (December, 1869) she thought there was a slight improvement in her condition, but this was not very

marked. The band in front of the right elbow had undergone a considerable change. Instead of but one, there were now several linear ridges, each presenting the brown rough character above described, although the new ones were much narrower than the original band. The intervening surface was also taking on a somewhat similar appearance, presenting parallel markings, very like those of a low degree of ichthyosis. The general aspect of the elevated ridges was such as strongly to confirm the patient's statement, that scratching was concerned in their production.¹

When one of the bands was scraped with a knife the effect was very peculiar. The surface creaked beneath the blade, and the epidermis came away as a substance which looked more like moist dirty sand than anything else. The exposed surface had a most peculiar glistening look, and afterwards became slightly red, as if moistened with blood. She experienced no pain, only a slight sensation as if she were being scratched.

I could not make out any definite microscopical change in the portions of cuticle removed. There was an entire absence of the appearances seen in ichthyosis, which will be described in another section of this paper. Some of the epidermic cells, floating free in the liquid in which they were immersed, had an unnatural glassy appearance. The application of iodine produced no change in them.

A new example of the disease of Thirial has also been recently recorded by Dr. Barton of Dublin.¹

The patient was a girl, æt. 23. The disease had begun four months before. As usual, it first appeared in the neck, and extended upwards to the face and downwards over the chest, as low as the nipples. An exceptional point in the case—and one which tends to confirm the view I have taken as to the relation between this disease and that described by Addison—is that on the back of the right forearm a patch of skin about the size of a crown-piece presented the peculiar induration.

Of "*circumscribed scleriosis*," the "keloid of Addison," two fresh cases have come before me within the last two years. One occurred in a young woman whom Mr. Birkett showed to me about eighteen months ago. There was a hard white ivory-like patch on the surface of the abdomen, and round this were the usual spots of yellowish-brown or fawn-coloured discoloration. Of the other case I have somewhat fuller notes.

CASE.—*Circumscribed Scleriosis.*

Miss J. S—, æt. 15, a patient of Mr. Freeman's, of New Cross. Five months ago she first noticed on the left side of her face a spot, more like a scar than anything else. It has not, she says, increased in size since that time. It is a little oval patch, situated in the furrow leading down from the nose to the left cheek.

¹ I have, at the present time, a case of psoriasis (*lepra vulgaris*) under observation, in which there is a narrow, straight, linear patch of the disease on the left arm, three or four inches long, by perhaps two lines broad, looking very much as if it had been brought out by the finger-nails.

² 'Dubl. Quart. Journ.,' Aug., 1869, p. 123.

It looks a little depressed below the surface, but is smooth and shiny, and of the usual whitish-yellow appearance.

The opinion which I gave about this case was that, if care were taken not to irritate the surface in any way, I hoped the induration would after a time subside, but that, very probably, similar spots would appear on other parts of the skin. I prescribed some cod-liver oil and some quinine mixture.

On October 4th I saw Miss J. S.— again. There was not much, if any, alteration in the primary patch, but a little of the usual brown discoloration could now be seen running from its upper edge towards the nose. A new spot had appeared between the shoulders, near the right scapula. It was of the size of a split pea, and presented all the characters of the disease. Not far from it there was also another spot, of more doubtful appearance, close to the spine.

One of the patients originally under Dr. Addison's care, and whose case was described by him in his paper read before the Royal Medical and Chirurgical Society, has been at the hospital within the last year, and was kindly shown to me by Mr. Birkett. It was in 1851 that she had been seen by Dr. Addison, and two models were made at that time, numbered respectively 220 and 221, exhibiting the right breast and the outer side of the left arm. Any one familiar with the contents of our museum will remember the model of the breast, which presents a deep, puckered groove, looking exactly as if it were a scar after an operation for the removal of part of the organ, and extending into the axilla. This deep scar-like furrow has now entirely disappeared, leaving the skin soft, supple, and perfectly healthy, or perhaps very slightly discoloured. There could be no more complete corroboration of the statement which I ventured to make that this disease tends to subside spontaneously. The patient could not tell me how long ago it was since the hardness had disappeared.

Of six patients affected with "Addison's keloid" who came under that physician's observation, and of whose cases records are preserved, this is the third whom I have had an opportunity of examining.

In the paper already more than once alluded to I went at considerable length into the literature of scleriosis, so far as it was accessible to me. I had not, however, seen a paper by Dr. V. Rasmussen, of Copenhagen, on "Scleroderma and its Relation to Elephantiasis Arabum," a translation of which, by Dr. Moore, appeared in the 'Edinburgh Medical Journal' for September and October, 1867.

The case on which Rasmussen's observations are founded is that of a woman, æt. 46, who had suffered for twenty-one months from a tumour in the right breast, and subsequently had an attack of erysipelas of the arm, when the skin of these parts became swollen and indurated. On admission the skin over the whole right mamma and half of the left mamma was hard and of a brownish colour, in some places streaked with red. Here and there were deep immovable folds, like those on the skin of the rhinoceros. There was no swelling, but considerable retraction of the connective tissue. Everywhere on the boundary, which was sharp, though irregular, the induration appeared to consist of knots as large as peas in the subcutaneous connective tissue. The right mamma was reduced to a small mass, of bony hardness. The hardness extended over the whole right lateral surface of the neck, where the knots mentioned were very prominent, and down over the scapular, axillary, and right lateral regions. The whole right upper extremity was swollen to about double its usual size. The skin of the arm, which was of normal colour, was extremely hard, and so closely connected with the subcutaneous tissue that it could not be lifted into a fold.

She died, with pulmonary symptoms and cyanosis, two months after her admission.

On post-mortem examination the brown colour of the right side of the breast was still visible. On cutting through the integument of this region it was found that there was no distinction between the corium and the connective tissue, the whole being converted into a dense fibrous mass, more than an inch and a half thick. The subcutaneous tubercles above referred to presented similar characters. The microscopical appearances were those of connective tissue, with abundant elastic filaments.

In the arm the condition appears to have approached much more closely to one of œdema, but here some very interesting microscopical observations were made. In every section the vessels in the skin and subcutaneous tissue were found to be surrounded by sheaths of closely packed cells, resembling lymph-cells.

The right pleural cavity contained four quarts of fluid mixed with blood. The membrane itself presented small tubercles,

which microscopically were found to be made up of lymphoid cells.

This very interesting case is made by Rasmussen the subject of a paper of considerable length. He endeavours to show that in scleroderma generally the hardening of the skin is brought about by a more or less marked erysipelatous condition, or at least by a stage of infiltration (lymphatic œdema); and that in this pathological process is attended in the first place by the formation of lymphoid cells round the vessels, the subsequent sclerosis being due to the development of connective tissue from these cells. He draws up a picture of the disease on the cases of Grisolle, Mosler, Arning, and others, quoted in my previous paper in the 'Reports.' Finally, he argues for the essential identity between scleroderma and elephantiasis Arabum (Barbadoes leg). In two cases of the latter disease which he had an opportunity of examining, he found what he believed to be lymphoid sheaths round the vessels of the skin, precisely similar to those which he discovered in the arm in his own case of scleroderma above described.

But I think it will strike every unprejudiced reader that in Rasmussen's case that its clinical history is very different, justifying that writer in assuming it to be identical with cases hitherto regarded as typical of scleroderma or elephantiasis. The colour of the affected parts (the right breast and chest) was different; there was another difference in the presence of induration in the subcutaneous tissue; the commencement of the disease was different—in that it began with an erysipelatous abscess which itself preceded by disease of the mammary gland; its course and fatal termination in a kind of hæmorrhagic pleurisy was different; and, lastly, it was accompanied by a sort of elephantiasis durum in the arm, and in this part, and *not* in the more extensively sclerosed regions, the peculiar lymphoid sheaths were present. There is, after all, nothing very surprising in the fact that the microscopical characters of the integument taken from a case of elephantiasis with bucnemia or elephantiasis should resemble those of the skin of an arm in the indurated, swollen condition which exists in Rasmussen's case. The assumption that this condition is an early stage of that observed on the chest, and would have passed into it, appears to be quite arbitrary.

It is, indeed, now evident to me that the diag-

scleriosis is a less simple affair than I formerly supposed. The affection of Thirlall and that of Addison—diffused and circumscribed scleriosis—make two well-marked pathological groups; and cases of either form are easily recognised by any one who is acquainted with their clinical characters, although it must be admitted that, from their rarely proving fatal, we are as yet unable to say with certainty what is their true anatomical nature. But there is no reason to suppose that with the establishment of these two forms of disease we have completed our nosological list, and have distinguished all the affections by which induration of the skin may be produced. It is much more probable that other diseases more or less similar exist, and will hereafter be distinguished, and erected into separate pathological groups.

One such disease we may probably even now recognise, as being of a malignant or cancerous nature. Such, in the opinion of many, was the following case, which attracted much interest while it was under observation in the hospital. It is unfortunately incomplete, for the friends of the patient removed him to the North of England, while apparently in the last stage of his illness. But I nevertheless think it best for me to include it in my present paper.

CASE.—*Diffuse primary carcinoma of skin (?)*.

(Reported by Mr. E. COLSON.)

Thomas R—, æt. 25, a shoemaker, from Louth, in Lincolnshire, admitted into Philip Ward, under the care of Dr. G. Owen Rees, January 15th, 1868.

For two years the right side of his chest has been the seat of a peculiar affection, which has gradually spread over its surface. At the present time it extends from the right clavicle above to about the sixth rib below, and over the sternum as far as about two inches to the left of that bone. It has a well-defined border. Within this area the skin is much altered in colour, being of a deep brown-purple hue. The colour disappears for an instant on pressure. The affected surface is shiny; it is also very slightly scaly. To the touch it has a brawny feel. It is slightly movable on the subjacent parts, but much less so than natural. It is oedematous, pitting on pressure, and the hollow made by the finger takes a considerable time to disappear. The affection gives the patient no pain, but only a feeling of tenseness and slight itching. The chest beneath is perfectly resonant. There is no tenderness over any of the ribs.

This remarkable condition of the skin is not the chief cause of the patient's coming to the hospital for admission. He is also affected with an unusual form of paralysis. This began about ten months ago, when he one day, while running, found that his legs "seemed to give way." Since then they have gradually got weaker. Within the last six weeks the power in his arms has gradually been declining. He has also had twitchings both in the legs and arms. He states that up to the

last eighteen months he was in the habit of occasionally drinking to excess, and he has had the same disease twice since.

On admission he is rather thin in the face, with an anxious expression. He is unable to stand. The right leg is the weaker of the two. He can bend or straighten either lower limb, but with difficulty; he can adduct the left, but not the right. He can just feel tickling of the soles of the feet. He can pass his water. His arms are very weak, especially the right. He can flex and extend the hand, but not with any force. He complains of stiffness of the neck, and of a dull pain, which passes into the left eye.

His heart and lungs appear to be healthy. Pulse almost imperceptible, 90, very œdematous.

On January 16th Dr. Rees prescribed a blister to the back of the neck, and of calomel to be taken every night.

On January 23rd it is noted that the pain in the neck still recurs every day, but not so severe, and lasts only for about half an hour instead of two hours, as at first. He thinks his legs are weaker.

On February 4th he was ordered Ext. Nucis Vomice gr. $\frac{1}{2}$, t. d.; and on the dose of this medicine was increased to gr. ss, t. d.

On February 29th he was ordered Potass. Iodid. gr. v, Liq. Potass. mxxx, Cascarill., bis die.

March 18th.—He has not had the pain in the neck for a fortnight. The right radial artery are barely perceptible; those in the left can be counted 108 in the minute.

On March 26th Dr. Fagge made the following notes as to his condition:—He says his legs are not weaker than they were; but it appears that there is very little movement of any other joints, except the hips. All the joints of the lower limbs are more or less rigid. Flexion of the hip-joints is effected smoothly and without pain, but they cannot be extended. The knee-joints are capable of only a partial extension, the ankle-joints admit of very little movement, the toes are rigid. The muscles are much wasted. The feet are of a livid colour, very œdematous. They are not cold.

"The upper limbs are much weaker than on admission. The muscles of the arms are greatly wasted, but those of the hands are not especially so. The wrists are dropped, and the backs of the forearms have a "flat" look, that seen in lead poisoning. The shoulders are partially stiffened. They cannot be entirely extended. The wrists, however, are free from stiffness. The fingers are flexed and cannot be extended fully, even by force. He has some power of voluntary movement in the fingers or wrists.

"The diaphragm seems to be enfeebled, for his breathing is chiefly thoracic. He appears unable to push forward the abdomen. He can only cough very weakly. There seems, he says, a tightness at the ensiform cartilage, which prevents him from breathing freely.

"The cutaneous affection has not spread since his admission. It presents the same characters as before, except that about half way down the sternum, in the middle of a soft spot can now be felt in the midst of the brawny purplish-red surface is no depression to be seen, but merely a soft fluctuating spot to be felt. It is as big as the end of one's thumb. It gives one the idea of there being a soft spot in the bone; but this appears to me doubtful, as the surrounding hard border is formed merely by the thickened tissues around."

On April 11th it is noted that there is a peculiar hardness of the pectoral muscles beyond the limit of the affection of the skin, so that they feel like the rind of bacon. At the ensiform cartilage, too, the hardness of the skin extends beyond the line of the redness. No other muscles are found to be hardened like the pectorals. The state of the hands remain the same. The thumb and fingers cannot be separated laterally so far as usual, on account of the rigidity.

On April 22nd it is noted that the arms have a firm board-like feeling. The flexor tendons of the arm and hand are felt as tight bands. The elbow-joints are kept flexed, and the wrists are flexed at right angles. He cannot straighten his fingers himself, nor can it be effected by moderate force. His general condition has undergone but little change. He has no pain, and eats pretty well.

May 7th.—Some of the fingers of the right hand swell and sweat very much, and then chafe.

On May 12th he was carried home into Lincolnshire by his friends, and since then nothing further has been heard of him.

I have already stated that when this case was in the hospital it excited a good deal of interest; I ought also to add that it created not a little difference of opinion. Members of the surgical staff who saw it held that the affection of the skin might merely be secondary to disease of the subjacent structures, and probably of the sternum or ribs. But it was generally thought by the physicians that the disease was really one of the integument, and that it was some form of malignant disease of the skin. A very faithful model of the case was made by Mr. Towne, and is now in the museum.

For my own part, I was much influenced in taking this view by the perusal of a second paper¹ by Dr. V. Rasmussen himself, whose views on sclerodermia I have been discussing. This paper is mainly based upon a case of which I will give a brief abstract.

A. M. A—, æt. 69, admitted January 4th, 1867, into the Municipal Hospital. Her left shoulder and arm were greatly swollen and their movements much impaired. The skin on the shoulder and upper arm was of a deep red colour, and was tense, shining, and inclined to peel off. Below the elbow the colour was more brownish-red, and on the hand it was natural. Pressure gave the sensation of a firm (pasty) infiltration, and strong pressure produced slight pitting; the skin could not be puckered or lifted into a fold. Towards the back of the hand the skin, however, pitted readily. From the shoulder the infiltration extended to the side of the neck, the axilla, and over the left breast. The integument in these regions was of the natural colour, except that to the left of the sternum there was a patch about the size of the palm of the hand a little depressed below the level of the skin, of a deep

¹ "On Primary Diffuse Cutaneous Cancer," by Dr. Vald. Rasmussen. Translated from the '*Hospitals-Tidende*,' Copenhagen, Jan. 1st, 1868, by W. D. Moore, M.D.; '*Ed. Med. Jour.*,' April, 1868, p. 871.

bluish-red colour, immovable, and almost as hard as wood; the same condition also extended along a belt about an inch broad over the whole lateral surface of the neck. This part further presented tubercles, of about the size of peas, of an intense bluish-red colour, lying in the skin itself. Smaller and paler tubercles were found scattered over part of the left breast. The axillary glands were much enlarged. Beneath the breast, and in the axilla, the infiltration was lost uniformly in the affected skin; *nowhere were distinct tubercles met with at the boundaries of the swelling.*

It was noticed that the skin on the breast, where the affection was more recent than above, could be slightly wrinkled or moved—an indication that the infiltration had not its seat in the skin itself.

The patient stated that her disease had begun three months before. On admission she was in good condition. She had all along complained of severe lancinating pains. The infiltration gradually extended, and on March 9th she died.

On cutting into the hard part over the chest the tissues down to the ribs were found to be “changed into a lardaceous mass,” yielding a greyish-yellow fluid on pressure. Microscopically this mass consisted of alveoli filled with numerous irregular flat cells with one or two nuclei.

Where the infiltration did not reach quite to the very cutis there were small scattered tubercles in the connective tissue, and similar ones were found inwardly toward the ribs. In all these tubercles the microscopical structure was as above described, except that the alveoli were large, “containing numerous and fresh cells.” On the other hand, the tubercles which projected on the surface of the skin consisted only of dense connective tissue.

The left pleural sac contained two quarts of fluid. The pleural surfaces presented whitish-yellow tubercles as large as peas. The fifth right rib had in it a nodule as large as a walnut. The liver contained two deposits of the same size, and several smaller ones. These had the usual appearances of medullary carcinoma.

During life this case was regarded by Rasmussen as one of sclerodermia; but after the post-mortem examination he entitles it “*carcinoma sclerosum subcutaneum et cutaneum.*” It will, I think, be admitted that there is a striking similarity between it and that of Dr. Rees above recorded. The only difference which might be regarded as essential is, perhaps, the absence of tubercles in the skin of this patient. It is, therefore, particularly worthy of notice that the cutaneous tubercles in Rasmussen’s case were found to be of a non-cancerous nature.

In the paper which contains this case Rasmussen further points out that both Alibert and Velpeau have described a form of cancer of the skin of which induration is one of the principal symptoms. Thus, in the great work of Alibert¹ we find a paragraph devoted to a form of cancer called by him ‘*carcine éburnée.*’ It may be said that the description which he gives of

¹ ‘*Monographie des Dermatoses,*’ 1835.

this disease reminds one very strongly of scleriasis, and that probably many of the cases which he includes under it were really examples of that affection; but even then it is to be added that the prognosis which he gives of his *carcine éburnée* is very unfavorable, so that in this respect his cases would seem to have differed from those of ordinary scleriasis.

Velpeau,¹ on the other hand, gives the name "*squirrhe en cuirasse*" to an affection which appears to be identical with that now under consideration. He claims to have discovered this form of disease in the year 1838, and it would certainly seem to be distinct from scleriasis. He speaks of it as a "*transformation ligneuse de la peau*," and compares the appearance of a part affected with it to that of skin which has been tanned, or a region on which the skin has been replaced by hard leather. He describes it as consisting of large patches (*plaques*), with smaller spots (*taches*) scattered near them. The colour of the diseased parts in this disease is said to be a mixture of red and brown, and this is well seen in the figure which he gives of it (pl. viii, fig. 1). In this the whole of the space between the breasts, as well as the skin over the breasts themselves, is seen to be of a reddish-brown colour. Among the cases of *squirrhe en cuirasse* cited by Velpeau is that of an English lady, in whom the skin had undergone "*ligneous transformation*" from the flanks to the neck and from the loins to the occiput, and who was besides riddled with "*squirrhus ulcers*," and presented a number of cancerous nodules (*bosselures*) as far as the axillæ and the shoulders. In this case and in others which he details the disease proved fatal.

Under the name of "*sclérodermie*" Dr. Plu² has recently described a case which appears rather to belong to this category than to that of true scleriasis, although Rasmussen cites it as an example of the latter disease.

A woman, æt. 59, had œdema of the left arm after carrying a heavy weight. This subsided at the end of a fortnight. Some weeks afterwards she was attacked by erysipelas, at first of the face, afterwards of the chest, left arm, and abdomen. The left arm then again became œdematous, and remained so. Three months after the erysipelas began the lower part of the chest became hard. This condition spread, until in three weeks it had invaded the whole surface bounded above by the supra-clavicular fossæ, below by the level of the umbilicus, and laterally on each side by a

¹ 'Traité des Maladies du Sein et de la région mammaire,' Paris, 1854.

² 'Gaz. des Hôpitaux,' 1866, p. 307.

line drawn vertically from the border of the axilla. The diseased part was of a *salet* colour. A few spots of induration could be felt beneath healthy skin only in the immediate vicinity of the indurated region. The patient died of dropsy four months later. No post-mortem examination appears to have been made.

It is, I think, impossible not to be struck with the resemblance between the accounts of the cases which I have been quoting the two of Rasmussen's and that of Plu—with the description of *squirrhe en cuirasse* given by Velpeau, and with that of a case recently in Guy's Hospital under Dr. Rees. In all of these we have an induration of the skin, with a reddish-brown coloration of the surface, commencing over the chest, spreading from that region as its centre, and tending to destroy the individual. It is true that the microscopical characters of the disease have as yet been but little studied. It must also be admitted that in different cases the affection appears to be attended with very different degrees of *malignity*, in the coarse sense of that term. In Velpeau's cases we read of one with characteristic foetid discharge; in the case of Dr. Rees, described above, the induration was uniform, and not so much as a nodule or tubercle could be detected.

ICHTHYOSIS.

Within the last few years opinions concerning this disease have undergone what may almost be described as a revolution. By the older writers on cutaneous diseases ichthyosis was referred without question to a morbid state affecting either the cuticle alone, or the papillary layer of the cutis likewise. Quite recently the attempt has been made to establish a different view concerning a large proportion of the cases included under this title.

The new doctrine was, I believe, first suggested by Erasmus Wilson.

According to this author¹ ichthyosis, which he prefers to xeroderma, is seen, as a congenital affection, in three degrees. In the first of these (x. simplex) the skin is more "dry, hard, thin, inelastic, brittle, discoloured, and in part small for the body it has to contain." In the second (ichthyoides) it is "rough, uneven, sordid, and broken up

¹ 'On Diseases of the Skin,' 6th edition, 1867, p. 355.

ragged plates, or smaller fractions corresponding with the areas of lines of motion of the skin." These two forms are stated to be due essentially to "defective development and defective nutrition" of the cutaneous textures. But in the third form (*i. saurioides*) we have, according to Mr. Wilson, a new element introduced—"an altered state of the sebiparous function, and an accumulation of the sebaceous substance on the skin in the form of dark grey or greenish scales or spines." Elsewhere, Mr. Wilson has referred to this last form of the disease as "ichthyosis *spuria* vel sebacea," and has proposed to reserve the title of "*true* ichthyosis" for the varieties previously mentioned.

The views of Mr. Wilson have been adopted both by the late Dr. Begbie,¹ in a very interesting article on this subject, and by Dr. Tilbury Fox. These writers, indeed, have carried the distinction between "true" and "false" ichthyosis somewhat further than Mr. Wilson himself. In his work on 'Cutaneous Diseases' M. Devergie had divided ichthyosis into three varieties, *i. blanche*, *i. brune*, and *i. porc-épic*; and of these he gave very admirable descriptions, based on clinical observation. Dr. Begbie and Dr. Tilbury Fox have adopted this subdivision, but maintain that only the first of these varieties ought to be called "*true*" ichthyosis, the two latter both belonging to the "*sebaceous*" or "*false*" variety of the disease. "Brown ichthyosis," says Dr. Begbie, "has no real resemblance to the white or true ichthyosis. . . . Unlike the true ichthyosis, this is not a general disease; it is found occurring round the knees, on the popliteal space behind, in front of the ankle, at the elbows and knees." . . .

In the 46th volume of the 'Med.-Chir. Trans.' Dr. J. W. Ogle has published a paper on two "Cases of Ichthyosis Spuria vel Sebacea," in which the correctness of these views is assumed as requiring no further demonstration.

Two sisters, æt. 10 and 14 years respectively, had, about five years before, become affected with the disease, after vaccination (as appeared from the history). Large patches of the skin on the chest immediately above the axillæ, on both sides of the trunk over the false ribs, about both knees, down both legs (especially near the ankles), and on the dorsal surfaces of the feet, were of a brown colour, in some places almost black. The discoloured parts were very rough, owing to masses of dry material covering the surface of the skin, which had the appearance of being broken into scales, or small tabular or lozenge-shaped patches.

¹ 'Ed. Med. Journ.,' 1861, vii, p. 1.

The scales from the skin were examined microscopically and chemically. Under the microscope they were found (after being softened with water) "to present a striated and wavy appearance, . . . much of which was obviously due to layers of epithelium closely compressed together." Chemically they yielded, on incineration, 8 per cent. of ash, containing lime, soda, sulphuric acid, phosphoric acid, and iron. "Ether readily dissolved out a very large quantity of fat."

Considering that the microscope showed the scales in these cases to have (in part at least) a definite epithelial structure, it seems remarkable that Dr. Ogle should have described them as examples of an "ichthyosis sebacea." The views of Mr. Wilson, however, have prevailed largely, not only in England, but even on the Continent. Hebra, in his work on 'Diseases of the Skin,'¹ refers to them with approval. A still more recent writer, Dr. Neumann,² appears to incline towards the same opinions. He speaks of "ichthyosis sebacea" as the simplest form of the disease; and although he afterwards says that severe ichthyosis is always attended with "hypertrophy of the whole cutis," he associates with this "a change and increase in the sebaceous secretion."

Indeed, so far as I have read, the late Dr. Hillier has been alone in repudiating the views of Mr. Wilson concerning ichthyosis, with the exception of Dr. Church.³

This writer has described a most interesting case, which had been under the care of Dr. Martin.⁴

A girl, *æt.* 15, who was small and delicate looking, so that she seemed at least two or three years younger than her real age, had an affection of the skin, confined to the left half of the body. The integument on the left side of the trunk was everywhere darker than on the right, a well-defined line being visible down the centre of the chest and abdomen. On the left side of the forehead and nose was a large patch, on which the skin was slightly papillary in character. A similar patch spread over the greater part of the cheek and chin, extending to the ear. The whole left side of the neck was occupied by the disease, "which here assumed a warty character, some of the papilliform outgrowths being pedunculated." The diseased area was limited abruptly both before and behind at the middle line. The scapular region was almost entirely occupied "by a large patch of steel-grey colour, very slightly elevated above the surrounding skin, and consisting of small polygonal scales." The skin, so altered, felt quite soft and smooth. The greater part of the left side of the chest was similarly affected, the areola of the nipple being the seat of

¹ New Sydenham Society's Translation, vol. i, p. 111.

² 'Lehrbuch der Hautkrankheiten,' Wien, 1869, p. 253.

³ 'Handbook of Skin Diseases,' 1865, p. 109.

⁴ 'St. Bartholomew's Hosp. Rep.,' 1865, i, p. 198.

long conical papillæ, of a browner colour than the surrounding squamous parts. At the border of the axilla, and in the axilla itself, the papillæ were longer than in any other part of the body. Smaller patches existed on the subscapular and lumbar regions; a very small one at the commencement of the anal fissure, and another larger one on the buttock. The skin of the limbs was natural.

The whole of the mucous membrane covering the inside of the left cheek, and the left half of the palate and tongue, were the seat of papilliform outgrowths, closely resembling those on the neck and in the axilla, but of a dull, yellowish-white colour. In the upper jaw the canine tooth and the left incisors were normal, perhaps a little smaller than those on the right side. The two premolars were very small and much decayed. No molars could be detected, and the gum was hollowed out into a broad and deep furrow, thickly studded with hard papillæ of a considerable length. The teeth in the lower jaw were quite natural in appearance, and all were present with the exception of the last molar.

* On post-mortem examination the arch of the aorta was found to be suddenly narrowed below the origin of the left subclavian artery.

Dr. Church does not, in his account of the case, speak of any microscopical examination of the affected parts of the skin, but he has informed me that such an examination was made.

In summing up, he speaks of the case as affording the proof that some cases, "at all events, of ichthyosis spuria, or sauriderma, are due to an alteration and hypertrophy of the papillæ of the corium and their epithelium, and not to dessicated and altered sebaceous substance, as stated by Mr. Erasmus Wilson." The description of the state of the mucous membrane of the mouth is, I think, in itself sufficient to prove that Dr. Church's conclusion is correct.

For my own part, I must express grave doubts as to there being any form of ichthyosis, or any disease to which the name of ichthyosis would naturally be given at the present day, in the production of which an accumulation of sebaceous matter plays any but an insignificant part. I do not for a moment deny that some of the older writers gave the name of ichthyosis to cases really of sebaceous origin. Thus, Dr. Anthony Todd Thomson, in his edition of Bateman's work,¹ describes the case of a young lady whose cheeks and the bridge of her nose became, when she was fifteen years old, covered with a dirty olive-brown crust. A figure of an almost precisely similar case will be found in the 18th Plate of Bateman's 'Delineations.' Mr. Wilson incidentally refers to such cases as examples of an *accidental* "sauriosis squamosa."

¹ 'A Practical Synopsis of Cutaneous Diseases,' 1829, p. 80.

These cases were, no doubt, examples of a "*seborrhœa sicca*," to use a term employed by Hebra and other modern writers. But it appears to me that it is only confusing matters to associate a local affection, such as this, developed late in childhood or in adult life, with congenital ichthyosis.

I have not myself had any opportunity of investigating microscopically the third or most extreme form of the disease, of which Dr. Church's case was an example. I must, therefore, leave the question of the nature of that form precisely where he left it. But of the second form of ichthyosis, the *i. brune* of Devergie, I happen to have been able to examine several cases; and the result of my investigations has invariably been that the masses removed from the surface were made up of epidermic scales, compressed together, and arranged in lamellæ, the superposition of which produced conical papilliform masses having a most delicate and beautifully striated structure. So far from this form of disease being essentially distinct from the so-called "*true ichthyosis alba*," I find that the microscopical characters of the morbid products are essentially the same in the two varieties of the disease. The only difference is that, as in the latter affection the scales are thinner, so the striæ above mentioned are found to be less numerous, and the appearances thus deviate less from those belonging to healthy cuticle. For in the most superficial layers of the natural integument similar striæ, though less marked, are quite distinctly to be recognised.

The first case of ichthyosis in which I microscopically examined the crusts was the following.—

CASE 1.—(Reported by Mr. GAITSKELL.)

E. P.—, æt. 34, admitted for incipient phthisis into Stephen Ward under Dr. Habershon's care.

Over the greater part of the back (but more especially between the scapulæ), and on the sides of the chest, the skin presents a peculiar appearance. This, he says, has existed for the last thirteen or fourteen years, but not previously. On examining the surface closely the fine lines are found to be further apart than natural, and the papillæ between the lines are raised and covered with a light brownish matter that looks very much like dirt, but is not really so. This can be easily scraped off. He says that the affected part of his skin has itched a great deal. He perspires over this region as much as, if not more than, over any other part of the body.

On microscopical examination of the scales removed from this patient's shoulders, I found them to consist of delicate, parallel

lamellæ, evidently formed of flattened epidermic scales. I endeavoured to make a drawing of the appearances observed, and this has been reproduced in the accompanying figure,



FIG. 1.

which, however, very inadequately represents the beautiful striated structure of the preparation itself, which was simply moistened with a little liquor potassæ.

The crusts were found to consist essentially of conical masses, each of which was itself made up of smaller portions, superimposed the one on the other, and evidently formed on the surface of the same papillæ. This is very well seen in the accompanying figure (Fig. 1, B). At C and D, again, we have two portions, each consisting of three masses, and both obviously moulded on the same three elevations of the derma.

Besides the hypertrophy of the superficial epidermic lamellæ, I also found that the cellular linings of the hair-sacs were greatly increased in thickness in the case of ichthyosis now under consideration, and I have since observed the same appearances in other cases. A very good example of this is shown at Fig. 1, A, where a number of concentric layers may be seen, surrounding an aperture which evidently was occupied by a hair. In Fig. 2 (p. 316), the same thing is exhibited from another point of view. The hairs are now shown longitudinally, and around them may be observed parallel striæ, coming off in a feathery manner, and evidently of cuticular origin.

The figure now referred to exhibits another point which I have over and over again noticed in examining crusts from cases of ichthyosis, and which seems to me to have an important bearing on the theory of the disease. It will be observed that



FIG. 2.

there are three or four separate hairs, all lying side by side, but having their roots at different levels, one above the other. It will also be seen that the root of each of these fine hairs is tufted. Now, this tufted character of the roots of the hairs indicates, I believe, that the hairs themselves have undergone the process of shedding,¹ and, if so, it will hardly be doubted that the hairs have all been formed within the same follicle, and have all successively been shed from it. The regular arrangement of their roots at different levels points strongly to this conclusion.

The appearances just described suggest a question which has not, I believe, been raised by any writer on ichthyosis, but which is of considerable interest. It is this:—Granting that the crusts in this disease are formed of epidermic scales, is the development of such crusts to be ascribed to an excessive formation of these cells—a true hypertrophy—or to an abnormal adhesiveness and tenacity, enabling them to resist the influence

¹ Any one may convince himself of the correctness of this statement by examining the roots of the hairs brushed out of his own head any morning. The point is of some importance, for this appearance of the roots of the hair has been regarded as characteristic of *tinea decalvans* (alopecia areata); whereas, in truth, it is merely a condition of common atrophy, the peculiarity of *t. decalvans* consisting in the limitation of the affected area and in the completeness of the baldness within those areas, but not in any special characters observable in the individual hairs themselves.

which ordinarily remove the superficial layers of the cuticle, and to remain heaped the one over the other?

Writers have generally assumed the correctness of the former of these hypotheses, but the facts observed appear to point rather to the latter. That several hairs formed successively within the same follicle should be found lying side by side—embalmed, as it were, in a single ichthyotic scale—would surely argue that this scale must have been of very slow formation. In corroboration of this view, I may add that in the patient on whom the observations above described were made I found but very little tendency to the reproduction of the scales while he was in the hospital; and, as I have already stated, I have observed the same appearances of the hairs, lying side by side, in other cases of ichthyosis also.

To this it may be answered, that in many cases of ichthyosis the scales are formed very rapidly, as is shown by the fact that they are constantly being shed in considerable quantities. I believe, however, that it will be found that this is more exceptional than is supposed, and that when it occurs it is often due to an *inflammation* of the skin, superadded to the ichthyotic condition.

By some writers the absence of redness and inflammation is made a cardinal point in the diagnosis of ichthyosis.

My own observations, on the contrary, lead me to believe that parts of the skin which are the seat of ichthyosis, at any rate in its less severe forms, are particularly liable to become inflamed. This inflammation shows itself in various degrees. The lowest grade of it is when a part, ordinarily affected with simple xeroderma, becomes red, and its thickened cuticle begins to peel off in large lamellæ. Infants, who are the subject of ichthyosis, are frequently brought to me in this condition. Under the use of *vin. antimoniale* internally, and emollient applications locally (among which I have found the glycerinum amyli very valuable), the redness and scabiness are, after a time, removed, and the skin then subsides into a condition of ordinary xeroderma. The following is a case of this kind.

CASE 2.—(Reported by Mr. J. CARR.)

"Walter G., *æt.* 3 years, brought to Dr. Fagge on January 29th, 1868. The mother stated that during the first winter after its birth the child had 'erysipelas' of the

face. The present disease, she says, began last winter. It first appeared on the face, and spread over the whole body, with large scales, like those of a fish. At present the skin of the face is much reddened; its surface is slightly scurfy; there are a few scales on the upper eyelid and right temple. The skin of the arm is scurfy. The abdomen is pretty free. There are some few scales on the root of the penis. The scalp is free."

On February 14th the skin is noted to be "redder, and the scales much larger. Ordered Vin. Antim. mij ex Aq. t. d.

Under this treatment great improvement took place. Subsequently cod-liver oil was ordered, and an alkaline lotion.

It can hardly, I think, be doubted that the erysipelas of the face, described as having existed during the first winter of this child's life, was really an inflamed ichthyosis. It is of considerable importance to make a correct diagnosis in a case of this kind, but it sometimes is not very easy to distinguish an inflamed ichthyosis, when occurring (as it most generally does) on the face, from a slight eczematous condition. I have been accustomed to look for a peculiar delicate striation of the skin on the lips and on the cheeks round the eyes, as showing that a really inflamed state of the face, with desquamation, is based upon a state of xeroderma, and is not a mere eczema. But I must admit that I have observed appearances not very dissimilar in some cases that have been simply eczematous.

This quasi-eczematous state is by no means the only inflammatory condition to which the skin of parts affected with ichthyosis is liable. I have now seen two instances in which a more or less distinct pustular affection or impetigo, and two others in which a pemphigus, has been present with a well-marked ichthyosis. I was at first inclined to regard these cases as instances of a mere accidental coexistence of two independent affections, but I think their number forbids such an interpretation. As the point is one which appears to have been entirely overlooked by previous writers,¹ I append full details of the cases in question. In one of them it will be observed that the inflamed parts formed large well-defined patches oozing and covered with crusts, and of quite peculiar appearance

¹ I may observe incidentally that in the first case which Dr. Hillier quotes in his 'Handbook' as illustrative of simple eczema, the patient had had xeroderma all his life (op. cit., p. 115). Dr. Hillier makes no comment on the association of the two affections.

CASE 3.—*Ichthyosis; retarded development, with misshapen features; eczema impetiginodes in patches.*

(Reported by Mr. F. D. GRAYSON.)

W. G.—, admitted into Stephen Ward, under Dr. Wilks's care, after being an out-patient of Dr. Fagge's for some little time.

Although nearly 17 years old, he does not appear to have arrived at puberty. His genitals are small and ill-developed, with no hair over or about the pubes. His face is ill-formed. The bridge of his nose is sunken and broad. The teeth are well formed. He is short for his age, being barely 4 feet 6 inches in height; but his limbs are not ill-proportioned.

The skin is universally dry and harsh. The cuticle is roughened and inclined to desquamate. The head is scurfy. The exaggeration of the furrows of the skin is very marked. On the upper limbs oblique lines, in places almost amounting to fissures, cross one another, dividing the surface into diamond-shaped spaces. On the face the peculiar delicate markings are plainly visible. The red part of the lips presents parallel striae, and from these fine lines radiate in all directions. There is considerable tendency to desquamate on the face, free edges of cuticle being seen in great numbers. When the forearms are rubbed, a few scales are detached. The boy says that his bed always contains scales every morning, but that these come chiefly from the inflamed patches described below.

On different parts of the body there are large, inflamed, moist patches, with very well-defined borders, more or less completely covered with yellowish flaky crusts. One of these occupies the upper part of the abdomen, stretching from the ensiform cartilage to the umbilicus. On the left thigh there are two similar patches, one in front, and one behind, the inner and outer surfaces being exempt. On the left leg a similar condition extends from the tubercle of the tibia to an inch and a half above the malleoli; it completely surrounds the limb. The right thigh is generally affected in the same manner, with the exception of its inner surface; and, externally to the patella, the disease is continued on to the right leg, which is completely surrounded by it. As the boy lies in bed, one cannot but observe a remarkable symmetry in the outline of the eruption on the two lower limbs.

No pustules are anywhere visible from which the crusts might have been formed. The surface is simply moist, inflamed, and oozing. In these patches the cutis is infiltrated and thickened, which is not the case when there is simply a xeroderma, from thickening of the cuticle.

The boy seems to be in good health. He eats and drinks well. He states that he very rarely perspires, whatever exertion he may make. The hands, he says, never sweat, but just at the tips of the fingers perspiration is abundant, and they are scarcely ever dry. At the time of examination, in fact, the ends of the fingers, which are redder and softer than the palms of the hands, are covered with fluid. When this is wiped off, it almost instantly forms again; and by means of a lens a multitude of parallel rows of minute drops of fluid can be seen, evidently oozing from the mouths of the sudoriparous ducts. On the other hand, it is distinctly noticeable that on the palms the usual lines of orifices of sweat-glands are entirely absent. Occasionally a slight depression may be seen in the position of one of these orifices, but even this is doubtful.

His urine is of a dirty yellow colour; sp. gr. 1028.

The boy states that the disease has existed since he was six months old. It has never quite disappeared, but he thinks it is better in the summer-time. None of his relations, so far as he knows, have been affected with a similar disease. He has several brothers and sisters. The inflamed patches have been present as long as he can remember.¹ They seem to have no tendency to increase in size.

After his admission yellow crusts formed on the right side of the face and on the right ear, which were free from them when he was first seen. The crusts were preceded by a moistness of the skin, but no distinct vesicles or pustules were to be discovered.

He was ordered to take Liq. Sodæ Arseniatis $\mathfrak{m}\mathfrak{v}$ ex Aq. t. d., and to apply some *glycerinum amyli* on lint to the inflamed patches. These soon became free from crusts, their edges grew less defined, and they acquired the appearance of a simple eczema.

CASE 4.—*Ichthyosis; imperfect development of the body generally; eczema impetigo of a large part of the cutaneous surface; affection of the nails.*

(Reported by Mr. J. DICK and Mr. W. F. FLOWERS.)

M. A—, æt. 17, admitted under the care of Dr. Owen Rees, October 9th, 1867, and afterwards under that of Dr. Wilks, February 19th, 1868. She lives at Romford. Her parents and the rest of her family are alive and well. Five months before her birth her mother is said to have been frightened by a monkey. At birth her hands and feet presented a peculiar white, milky appearance, as if they had been soaked for some time in warm water; in fact, like that of the hands of a washerwoman. She was always very ill-developed, in comparison with her brothers and sisters, and when five years old she was unable to walk.

Soon after birth small flakes of skin began to fall from her hands and feet. The back of her neck soon became affected in a similar way; gradually the trunk and then rest of the limbs became involved, and lastly the face and the front of the neck. Before she was twelve years of age her whole body was covered. There was freedom of the skin. She took much less exercise than other children, for walking a distance produced much irritation and soreness, relieved only by the application of grease. As far back as her memory will carry her the eruption has been attended with great pruritus, especially at night when she gets warm, so that she scratches off great scales from her skin.

When she was thirteen years of age an eruption very similar to that of smallpox came out over her body, and discharged matter. At other times large blebs have formed, and discharged matter.

Latterly the pruritus has increased very much, and prevented her sleeping.

When fifteen years old she saw a woman in a fit, and was immediately seized with one herself. She has had repeated attacks since, which seem to be of an hysterical character.

Her legs have at times been slightly enlarged, especially after exposure to damp and during the night.

¹ Mr. Bryant, however, tells me that the boy has been under his observation for some years past on account of the ichthyosis, and that the inflamed patches are of comparatively recent development.

She has never menstruated.

On admission she is a stunted, ill-developed girl, with a peculiar caste of countenance. She is knock-kneed, and the tibiae are curved. The knuckles of the fingers are very prominent, and the fingers are bent laterally towards the ulnar sides of the hands (in the same way as is seen in so many cases of chronic rheumatism). The ring fingers of both hands are longer than the others. She is moderately intelligent.

The general character of the integument is that the cuticle is thick, dry, and stiff. She is thus, as it were, hide-bound. She is unable to extend the elbow-joints and can with difficulty straighten the fingers. The face is very little affected. The mouth is slightly puckered, and the skin over the forehead, the upper eyelids, and the cheeks, is slightly branny.

On the limbs the thickening of the cuticle gives rise to a great exaggeration of the natural furrows of the skin. All the more movable parts are covered with parallel lines, often crossed by other parallel lines, obliquely or at right angles. These lines are redder than the intervening spaces, and in the flexures of some of the joints they form deep cracks or fissures, which ooze and give the patient great pain. This is especially the case over the wrists and the backs of the hands, and over the heels, so that she has sometimes been unable to wear shoes for days together.

In some places these lines or furrows are separated by rounded ridges, with white edges of loosened scales projecting from them. Elsewhere the furrows, perhaps a quarter of an inch apart, cross one another, so as to enclose quadrilateral or shapeless plates, each with a border of loose white epidermic scales. On the inner side of the elbows and ankles there is a still further thickening and division into small quadrangular, easily powdered scales.

The cuticle of the palms and soles is very thick, and without much tendency to desquamation. The nails are much curved inwards, badly formed, rather thin, and ribbed longitudinally. They are surrounded by thick, very irregular walls. The nail of the right thumb is peculiar. It is bounded by no fold, and has no free border. Its substance is as thick as that of the other nails. Its surface is smooth, and well formed over a space about a quarter of an inch in diameter in its centre; and from this it gradually becomes less thick and shining on all sides, and passes, with but a slight attempt at forming a free border, into the horny cuticle of the thumb. It shells off towards the tip, and has seldom been cut.

The trunk is of a remarkably dark colour. It is covered with scales, and also (as well as the thighs) presents numerous flat vesico-pustules. Similar vesico-pustules have (she says) been present as long as she can remember. There are some, but not very numerous, excoriations on the chest, back, and thighs. For a little space round the left nipple the skin is nearly natural in appearance.

The neck is affected with the disease anteriorly as high as the jaw (where it ceases rather abruptly), posteriorly as high as the roots of the hair. The scalp is very scurfy; the hair of the head is scanty, dry, and of a light brown colour. The few hairs which exist on the surface of the body are not straight, but bent into zigzag forms.

The cutis or true skin appears *not* to be at all thickened.

The skin acts most freely in the armpits and between the thighs, but also on other parts. A peculiar disagreeable odour is emitted from the surface.

[After she had been for a time in the ward it was noticed that her night-dress was wet through in the morning.]

The axillary glands are, and have for some time been, much enlarged, as are those in the axillæ and groins.

The mucous membranes are unaffected. The tongue is flabby and pale. appetite is generally moderate, but sometimes ravenous. The bowels are regular. P. 102. R. 22. The urine contains neither albumen nor sugar; it deposits abundant urates; its sp. gr. is 1022.

She was ordered alkaline baths, each containing ʒiv of carbonate of soda, a lotion consisting of one part of glycerine to three of water. The application of appeared to give her relief. She stated, when admitted, that she thought baths before done her more good than anything else.

There was some bronchial breathing beneath the left clavicle, and she was somewhat, and had night sweats.

She left the hospital April 7th, 1868.

CASE 5.—*Ichthyosis, not strictly congenital; eczema.*

(From notes taken at the time.)

W. T.—, æt. 15 months, brought to me in April, 1869. About a month ago roughness of the skin of the arms and forehead appeared. Since then this condition has been increasing. The mother states that it first came out while he was cutting a tooth, and that the eruption has twice appeared to become exaggerated when the same process was going on.

At present the cuticle on the arms and face is very dry and rough. On forehead the horizontal wrinkles are very marked, especially when the occipitalis acts. At intervals there are vertical cracks through the cuticle, which here slightly separating from the layer below. In the centre of the forehead, extending laterally for an inch and a half each way, is a patch of what appears to be eczema. On both cheeks the vertical cracks are very marked and close together. On both forearms, as high as the elbow, the same condition of skin exists, natural furrows being increased and crossed at intervals by cracks in the cuticle. This is much more marked on the extensor than on the flexor surfaces. The fingers and palms are also dry and horny. On the legs the cuticle is dry, and the furrows are more marked than natural, but there are no cracks.

CASE 6.—*Ichthyosis; shortness of stature; pemphigus.*

(Reported by Mr. T. P. DOUGLAS.)

"A. T. C.—, æt. 10, admitted into clinical ward, under Dr. Fagge's care, April 17th, 1869. His father, mother, three brothers, and two sisters, are alive and healthy. A first cousin of his father's is said to be covered with scales. With the exception of the scaly affection of his skin, which is congenital, the patient has enjoyed good health. His mother says that when he was a week old large blisters appeared over his body, some of which sometimes discharged as much as a teacupful of milky fluid. Ever since that time he has been subject to eruptions of similar kind, although of smaller size. They come out especially when he is out of health from any cause. Sometimes he is free from them for an interval of two or three months.

"On admission the patient is a robust and rather good-looking boy; he is somewhat smaller than his age, but is not ill-formed. He is very dirty, and his skin exhales a disagreeable sickly odour, something like that of dirty feet which have been perspiring for some time, but even more powerful.

"His neck, and particularly the back part of it, is red, and the cuticle of this region is thick, rough, and covered with scurfy scales. The sides of the body are also scurfy. In both axillæ, in the bends of the elbows, on the wrists, in the groins, in the popliteal spaces, and over the upper surfaces of the ankle-joints, the cuticle is dry, hard, of a more or less deep brownish tinge, and raised into parallel ridges, separated from one another by deep furrows. The most marked patches of all are those occupying the axillary regions. These are situated chiefly on the anterior and posterior folds of the axilla on each side. The bottom of the fossa is free. The direction of the ridges above described is transverse. They are so large that pieces of considerable size can be removed from them with scissors without any pain being given or the skin being made to bleed.

"On the palms of the hands and soles of the feet, and also on the inner sides of the feet, the cuticle is of a yellowish colour, hypertrophied, shining, and cracked, with somewhat the appearance of large scales. The natural furrows of the palms are deep and broad.

"On the extensor sides of the joints the cuticle is thickened, hard, and scaly.

"On the hands and legs are two or three recent blisters. These are filled with a pellucid milky-looking serum, and are surrounded by inflamed areolæ.

"The tongue is clean; the appetite good; the bowels regular.

"The chest sounds are normal. Pulse 106."

He was ordered *Liquor. Arsenicalis* miiij, *Tinct. Gentian.* xxx ex Aq. ter die.

On August 27th it is noted that "one or two fresh blisters have come out since his admission, but not so many or so large as formerly." He was ordered an alkaline bath every other day.

September 3rd.—"No fresh blisters have come out lately. The ichthyotic condition of the skin is not so marked as when he came in, perhaps from his being less dirty."

7th.—"Since he has had the alkaline baths the skin covering the palms and soles has become softer."

25th.—He left the hospital. During his stay only one or two fresh blebs had come out. The ichthyotic parts were softer than on his admission.

On November 26th I sent for him from Plumstead, where he lived, in order that I might see what his then condition was. His mother told me that he was much better than before his admission. While in the hospital he got quite fat, but since his return home he has been going back in condition. No blebs have appeared since that time. The condition of the parts most markedly ichthyotic is much as before. The state of the palms is, perhaps, best described by saying that they have a worm-eaten look, rough edges of epidermis projecting irregularly from all parts of the surface; the cuticle of the palms is not now markedly thickened or harsh.

I examined with great care portions of the ichthyotic ridges removed from the border of the axilla with a pair of fine scissors. I could not succeed in making sections of these, but their structure could be made out without much difficulty; they consisted mainly of epidermic cells, which were in many places arranged in lamellæ, piled one over the other, so as to make long papilliform processes. In certain of these papilliform processes there was a central axis, transparent, structureless, and horny looking, with some black spots in it, looking as if they were vacant spaces (the black appearance being due to refraction). I saw no trace of the presence of any vascular processes of the cutis; but as only the summits of the ich-

thyotic ridges were cut off by the scissors, it was hardly to be expected that these should be seen, even if they existed.

Some of the scales from this patient, chiefly from the neighbourhood of the axillæ, were handed to Dr. Stevenson, who kindly analysed them for me, and found that they contained 27·46 per cent. of fatty matter, of very ill odour, soluble in ether.

CASE 7.—Congenital hereditary ichthyosis; pemphigus.

(From notes taken at the time.)

"A. W—, æt. 3 months, was brought to me on May 4th, 1869. His mother stated that for nearly two months after birth his skin had been quite clear. The face then became rough and scaly, and also his hands, arms, and feet. This condition continued till three weeks ago, when small blisters, of about the size of peas, appeared on the dorsum of the foot, chiefly about the fold of skin opposite the ankle-joint anteriorly. At the end of two or three days these blisters became confluent and burst; they contained a clear fluid, and there was redness round their bases. Medical advice was obtained, and they got better. Two days ago these small bladders came out again in the same situation as before, and also some about the arms. Some of them burst on the same day on which they appeared.

"The mother has ichthyosis of her face and hands, and another child has been affected with the same complaint since birth. There is no history of syphilis in the parents. The mother states that other members of her family have rough skins.

"When the child was brought to me it was observed that the skin of the face and hands was in a dry, rough, scaly, ichthyotic condition. The folds of skin at the back of the neck were red, dry, and rough, and horny to the feel. Scattered here and there over the surface were clusters of vesicles, from six to ten in number in each cluster. Each vesicle was of about the size of a hemp-seed, rounded at its summit, and containing an opaque serum. The anterior and back parts of the thighs were in a similar condition, the red and thickened state of the skin being more marked and seeming to precede the vesicular eruption. There was also redness about the anus, and some clusters of vesicles immediately around the orifice and along the line of meeting of the two folds of the buttocks.

"On the dorsum of each foot, in the fold opposite the ankle-joint, and reaching round laterally to the malleoli, is 'a mass of blebs composed of vesicles running one into another, some filled with fluid and some burst.'

May 11th.—"The patches now present superficial excoriations of a very ill-defined character."

18th.—"Great improvement has taken place since the last report."

I saw this child again in the end of November, 1869. There had been no return of the bullous eruption. The ichthyotic character of the skin was still well marked.

Another character of ichthyosis, which has almost escaped the notice of dermatologists, is its association with an imperfect development, or stunting, of the body generally. This has been

very marked in the two most severe cases of ichthyosis that have come under my observation. It is fully described in the reports of these cases which have just been given. In some of the slighter forms of xeroderma, however, the bodily frame is fully and perfectly developed.

It may be of interest that I should quote the statements of previous writers on this subject, so far as I have noted them down. Thus, Alibert says that the subjects of ichthyosis are well-formed as a rule, but sometimes rickety. In his account of two brothers Lambert (of the celebrated family of porcupine men), he says that they had high foreheads and large noses, but that one of them had his nose much flattened at the root. [It will be observed that both the stunted and imperfectly developed patients above described had noses with very flat roots.] In accounts of individual cases, I have more than once found it mentioned that the patient was small and ill developed. Dr. Church says that in his case, the girl, *æt.* 15, was small and delicate looking, and appeared to be two or three years younger than she really was.

This is, perhaps, the best place to mention the statement of Mr. Erasmus Wilson, that the skin in xeroderma is in parts too small for the body. "This," he says, "is curiously manifest on the face. The eyelids are insufficiently large, the nose looks pinched, and the skin is stretched across the cheeks. The fingers look contracted, and the knuckles of the metacarpophalangeal articulation crop out in the middle of the back of the hand." This description recalls to some extent the appearance of the face and hands of M. A—, whose case has been described above. But in her there was no tightness of the skin, such as Mr. Wilson describes. On the contrary, it was inelastic, and fell into folds like a badly fitting glove, especially on the backs of the hands and fingers. The deformity was evidently due to an imperfect development of the deeper structures. The view of Mr. Wilson's, just referred to, is perhaps, in part, based on the appearances seen in cases of so-called "harlequin-fœtus," in which the skin is cracked into symmetrical fissures. Of this affection we have several examples in the Museum. It has been sometimes assumed to be a form of ichthyosis, but I am not aware that any good description of its minute anatomy has been published.

disease not uncommonly affects some one part of the body more severely than others. Thus, I have more than one case especially marked over the bend in front of the ankle-joint. This is the case in each of two sisters who are now attending hospital on account of ichthyosis. To a superficial observer might even appear that in them the disease is confined to the regions referred to; but in reality they both have widespread xeroderma of the face, arms, and other parts.

CASES 8, 9.—*Ichthyosis in two sisters, not strictly congenital; affection*

Elizabeth D., æt. 14, and Ellen D., æt. 8, sisters, both affected with ichthyosis, from which their father and mother and another sister are exempt.

The elder girl, Elizabeth, cannot remember to have ever been free of the disease, but believes that in her infancy there was a time when it had not. She distinctly recollects that her sister Ellen presented no indication of the disease for several months after birth.

In both girls the face is dry and rough, and presents ridges, and parallel striæ. There is but little mobility of the upper eyelids. The marked seat of the disease is in front of the ankle-joints in each girl. The skin is rough and brown.

[A model was made of the ankle of each of these girls, by Mr. Town. The models are now in the Museum.]

The cuticle of the arms is harsh, and when they are rubbed, a fine scale comes from the surface.

The elder girl is the more severely affected of the two. She has no itching. Contact with water produces much smarting. In the winter her skin cracks much, but does not water. In the summer she is much more comfortable. The appearance of the skin does not become natural. The nails of the first and third fingers of the right hand are thickened and hollowed longitudinally.

But this remark, although, no doubt, generally true of the slighter forms of the disease, is not true when applied to the most severe of all, the *i. porc-épic* of Devergie. Dr. Church's case above referred to affords an instance in which the ichthyotic patches were perfectly well defined. In one respect, I believe this case is unique—namely, in the circumstance that the ichthyosis was confined to one lateral half of the body, the other being entirely free from it.

Another point, in which this case of Dr. Church's differs from all others which I have read of, is the fact that the ichthyotic condition affected not only the skin, but also the mucous membrane of the mouth, the palate, the tongue, and the gum over the upper jaw, so that some of the teeth were wanting, and others very imperfect. This fact is of the more interest as it certainly tends somewhat to justify the use of the term *ichthyosis glossæ* applied by Mr. Hulke¹ to a papillary affection of the tongue, analogous in its anatomical characters to the papillary form of cutaneous ichthyosis. I must still, however, maintain that so long as no strictly local form of cutaneous ichthyosis is recognised, the same name cannot without reservation be given to a mere local affection of a mucous membrane, and particularly since Mr. Hulke himself describes the *ichthyosis glossæ* as having a special tendency to terminate in epithelioma.

Among different writers on the subject of ichthyosis there are considerable discrepancies as to the parts most frequently attacked by it. Thus, Alibert and others describe it as generally sparing the *face*. But even if this be true of the more severe forms of the disease, it certainly is not so of the slighter degrees, which (as I have already stated) are often especially marked round the mouth and eyes. Other writers, again (as, for instance, Neumann), speak of the flexion aspects of the joints as always free from the disease. Now, this is a distinct error, and a statement exactly contrary would be nearer the truth. Devergie, indeed, long since made it one of the characters of the "*ichthyose brune*" to be generally confined to the spaces round the knees, the hollows of the ankles, elbows and wrists. The faithfulness of this description will be made apparent by a perusal of the case of A. T. C— (see p. 322), in whom the disease was

¹ 'Transactions of the Clinical Society.'

much more marked in the regions indicated, and in the folds of the axillæ and groins, than on any other parts. Lastly, Alibert, Chausit and others, have spoken of the palms of the hands and soles of the feet as being spared by ichthyosis. So far as I have seen, however, these parts are very generally affected, although not in a very intense degree. The ichthyotic state of the palms and soles was, for instance, well marked in the case of A. T. C—, and also in that of W. G—. In the latter, indeed, the very interesting observation was made that the sweat-glands appeared to be absent or deficient on the palmar surfaces of the hands and fingers, except at their tips, where they were well marked and appeared to be peculiarly active.

The absence or deficiency of the perspiration is described by almost all writers as one of the characters of ichthyosis. This is not, indeed, very marked in every one of the less severe cases, but, as a general rule, no doubt, the usual statement is correct.

It will, I think, be granted that the cases above recorded prove that in ichthyosis there is a tendency, not only to the occurrence of eczema and impetigo, but even to the formation of bullæ and the production of a pemphigus.

Before quitting this subject, I think it worth while to quote the following case. It was, I believe, an example of the disease described (originally by Cazenave) under the name of pemphigus foliaceus; but in its characters at the time of observation it bore a most striking resemblance to an inflamed ichthyosis.

Ann C—, æt. 40, admitted into Mary Ward under Dr. Gull's care, June 12th 1861. She lives at Biddenden. She is married, and has had three children, two of whom are healthy and one has died of hydrocephalus.

She has always had good health till two years ago, when the existing disease commenced. Formerly she drank beer, and not spirits; latterly she has taken spirits. The catamenia were regular until she became ill. Since that time she has on menstruated twice, and then scantily.

When the eruption first appeared, two years ago, it began below the right elbow and below the left breast. A little red mark, like a gnat-bite, was the first thing that she noticed. This gradually spread without forming vesicles.

On her legs it came out with blebs as large as nuts, and also on her breast but none such have made their appearance for the last eighteen months.

At first there was much itching, but latterly the eruption has neither itched nor smarted. The disease was at one time much worse than it is now.

On admission "her whole body is covered with the disease. The true skin is re-

in some places, but soft. The scabs are universally distributed, but are smaller on the flexor surfaces. There is some amount of moist exudation, staining the night-clothes about the shoulders. Some fluid also oozes from behind the ears. Elsewhere no moist secretion is observable. The scabs cover the scalp. Over the forehead and face their under surface is beset with fine processes; these are chiefly formed of matters drawn out of the sudoriparous ducts; some of the longer of them, however, are fine hairs.

"She has lost the eyelashes from her lower lids, and at one time she says that there were none in the upper lids. The eyebrows are scanty."

She sleeps well. Her bowels are regular. Her appetite is good. She has great thirst.

Her skin often feels hot, *but does not perspire.*

She was ordered to apply Ung. Zinci Benzoyatum to the skin, and to take Amm. Carb. gr. iv, Tinct. Calumb. ʒj, Infus. Calumb. ʒj, bis die.

Unfortunately she would not stay in the hospital, but went out after a few days.

I have already remarked that I now believe this case to have been an example of the disease generally known as pemphigus foliaceus, but in my note-book I headed it "Eczema rubrum, resembling very closely the ichthyosis of infants;" and I well remember that, at the time, Dr. Gull laid much stress on its resemblance to the latter disease. Since that time I have never seen a case of *inflamed ichthyosis* in an infant without being reminded of the appearance which the poor woman presented. There is, indeed, on one minute point of analogy between the two affections, which, if duly investigated, might perhaps throw some further light on the subject. I refer to the minute processes which were found on the surface of the "*crustæ lamellosæ*" removed from the face in the case just related. I well remember pointing these out to Dr. Gull; and I also remember examining them microscopically, although I cannot recollect with what result, and I am inclined to think that some error has crept into my notes, in which I find it stated that "some of the longer ones were fine hairs."

However this may be, similar delicate processes are certainly to be seen on the under surface of the "*crustæ lamellosæ*" in certain cases of ichthyosis in young children, and, so far as I know, in no other disease. The following case is one of which I took notes, when Physician to the Royal Infirmary for the Diseases of Children.

George C—, æt. 7. About 3 weeks after he was born, "little spots like clear water" came on his face, and subsequently (perhaps in three or four months) his whole body became affected in the same way. At birth his skin was quite clear.

When he came to the infirmary his face and whole body were covered with large

plates of cuticle, peeling off, and with fine processes projecting from their under surfaces. The palms of the hands and fingers were free, there being merely a few slight folds near their tips. The affection did not extend into the head, in which there was merely a little scurf. All the parts recently deprived of cuticle were red. On the scales from the chest the processes above described are very well marked. The eruption itches very much. The hair, eyelashes, and nails, are well formed.

In Hebra's work on 'Diseases of the Skin' there is a passage which perhaps refers to a similar appearance. "When it has been of long duration, the seborrhœa oleosa gives rise to appearances which differ from those hitherto described. Under these circumstances crustæ lamellosæ, which may be either as thin as paper or as much as half a line in thickness, form on the forehead, cheeks, nose, and even on other parts of the face . . . Their upper surface is uneven and rough; their under surface, which is in contact with an otherwise healthy skin, has projecting from it certain small conical processes, which pass into the dilated ducts of sebaceous glands."¹ It is to be borne in mind that Hebra is among those who believe in the theory of false or sebaceous ichthyosis, and that he quotes Mr. Wilson's statements on the subject with approval.

On the question whether any of the recognised forms of ichthyosis can appear after infancy has been passed, I have no definite information. We have a model in our museum labelled "Ichthyosis Senilis—the model of the leg of an old woman æt. 70 years, affected with ichthyosis;" but I am very doubtful whether this is correctly named. It will be observed that in several of the cases in children, above recorded, it was stated that the skin had been perfectly free from the disease some months after birth.

It must be borne in mind that in this respect the patient's statements are not always to be relied on, as the following case shows, which was at first regarded as one of senile ichthyosis because the man himself asserted that he had had no affection of the skin until three years before.

CASE 10.—*Ichthyosis; severe prurigo.*

(Reported by Mr. F. C. BATCHELOR.)

H. H.—, æt. 69, came as an out-patient to Dr. Fagge in September, 1869, and was admitted into Stephen Ward under Dr. Wilks, on October 22nd.

He states that about three years ago he first noticed a rash on the front of

¹ Syd. Soc. Translation, vol. i, p. 106.

forearms; this began in the form of little red spots, which caused a good deal of itching, so that he used to scratch till they bled. Sometimes he can get no rest at night on account of the irritation. He lives at Foxley, in Norfolk, and has been under the care of several medical men; he has employed sulphur and red precipitate, but without benefit.

On examination it is found that the skin all over the body is dry and like parchment. This is simply due to a thickening of the cuticle, for the cutis is thin and quite free from infiltration. The surface is shiny, and apparently free from any tendency to desquamate. When it is scraped no great quantity of cuticle comes off. The superficial markings or lines are in most places deeper than natural, and further apart, and this gives a coarse appearance to the skin.

He has never noticed that any scales become detached from his skin and fall into his sheets or clothes. On scraping the legs very little comes away.

He sweats as much as other labouring men when at work, especially on the legs.

The xeroderma, although slight in degree, is nearly universal. The parchment-like character is most obvious on the lower limbs, but on the back and shoulders the exaggeration of the furrows is well marked. The cuticle on the palms of the hands is very thick, and on the backs of the hands it is harsh and leathery, so as to interfere with the movements of his fingers. This he ascribes to his work, in the course of which his hands are constantly getting sodden in water. The skin of the face and neck appears to be healthy.

His original statement was that his skin had been healthy until three years before, but on closer cross-examination he admitted that he had always had a rough skin, and that the irritation alone had been of recent occurrence.

On admission he was ordered a warm bath; this gave great relief to the itching. He was therefore directed to take a bath every morning. Under its use the papular rash and irritation quickly disappeared. The legs, however, acquired still more markedly the character of xeroderma in this respect, that slight, pale red fissures appeared crossing one another, and splitting the superficial cuticle into quadrilateral areas. The palms of the hands also seemed more inclined to crack than before.

PEMPHIGUS.

Of all cutaneous affections, this is perhaps the one which raises in a most distinct form the question between the two methods of dermatological classification—the artificial system of Willan and Bateman, and the more natural arrangement for which we are now striving.

To the follower of Willan and Bateman nothing should be easier than the diagnosis of pemphigus. Erysipelas, which was placed among the Bullæ by Willan, was removed to the Exanthemata by Dr. Thomson, and there were left under the former head only pemphigus and pompholyx, between which two genera (as defined by Dr. Thomson) no distinction can be said to exist. It would appear to follow that the presence of a bulla is sufficient to show that the patient has pemphigus.

By Devergie, indeed, this position is actually main-
 "Wherever," he says, "a bleb appears without external
 the patient has pemphigus."

In criticising this statement it is to be observed th
 question is merely one of the use of terms; and I must
 tain that to apply the name of pemphigus to every c
 which bullæ are seen on the cutaneous surface is to c
 that term of all real signification. I will therefore me
 few instances, taken from my note-book at random, in
 bullæ were present, and in which it would yet have been
 (as it appears to me) to say that the patient had pemphig

One such instance occurred during the debility produ
 lactation.

CASE 1.—Mrs. S—, æt. 36, had been suckling for twelve months, wh
 began to form on her fingers. In the course of the next two months at lea
 six such bullæ appeared. When she came to me there was one near the en
 left thumb; it was flat and oval, and measured about two thirds of an in
 long axis.

This woman had had two miscarriages, three children
 dead at the end of seven months' gestation, and only
 children born alive. It is therefore possible that she ma
 been the subject of a syphilitic taint, although of this I
 find no further evidence. I believe I have seen, in at lea
 case, similar bullæ on the fingers in advanced syphilit
 chexia;—whether as a result of the syphilis or of the cac
 I could not determine.

Another condition in which blebs form, but to which I
 would think of giving the name of pemphigus, is after it
 to the nerve trunks, causing anæsthesia, as shown by Mr
 chinson.¹ Very similar bullæ are described by Carte
 occurring in the anæsthetic form of elephantiasis Græc
 as was, indeed, illustrated in the case of this disease recor
 Dr. Rees in these 'Reports' two years since. In both inst
 however, it may perhaps be thought that the bullæ are
 produced by external injuries, of which the patient i
 sensible, in consequence of the numbness of the skin.

Again, it is not very uncommon for a bleb or two to
 in urticaria and in erythema nodosum, but no one
 think of using the name pemphigus for such cases.

¹ 'London Hosp. Rep.,' 1866, p. 305.

² 'Med.-Chir. Rev.,' 1863, Jan., p. 183.

Scabies is another disease in which bullæ may form, so as perfectly to simulate an ordinary pemphigus. This fact is one which has, I think, been generally overlooked,¹ but a knowledge of it is of great importance. Two years ago a patient was admitted into the clinical ward, under my care, with what appeared to be typical pemphigus, one of the bullæ being as large as a hen's egg. The affection turned out to be *simply a manifestation of scabies*.

CASE 2.—(From the report of the Clinical Clerk, Mr. BRANFORD EDWARDS.)

A. E—, æt. 13, has had an eruption on her skin for about a year, ever since an attack of fever. For the last six weeks large bullæ have appeared on the arms and legs. They come out one or two at a time, and burst after two or three days, leaving ecthymatous sores. At the present time there is a bulla, the size of a hen's egg, over the inner surface of the left tibia, and numerous large crusts are scattered over the legs and arms. Upon the elbows are several pustules. Between the fingers are several small scattered vesicles, very like those observed in scabies. The girl, however, declares that she has no itching whatever about the fingers, although she admits that an inflamed patch covered with crusts, situated near one wrist, gives rise to itching.

On the most careful examination I failed to discover any burrows of acari about the hands or on any part of the patient's body. But with a magnifying glass I thought I could see slight whitish lines on some of the vesicles between the fingers. I therefore cut off the summits of these vesicles and placed them beneath the microscope. One of them was found to contain a little brown body, evidently the framework of the head and forelegs of an acarus. I made a rough drawing of it, as seen by the one-eighth objective of an Oberhäuser microscope. From my sketch the subjoined illustration is copied.



FIG. 3.

The little white lines which I had seen on the summits of the vesicles were therefore moulting-galleries. No further evidence of the presence of the itch-mite was discovered; but sulphur ointment at once cured the eruption. I saw the girl frequently for several weeks, and she never had any return of it.

Since that time I have on one or two occasions found pre-

¹ The only writers, so far as I am aware, who have mentioned it, are Hebra (op. cit., p. 393) and Jon. Hutchinson ('Lond. Hosp. Rep.,' I, p. 159), and even they speak of no blebs larger than beans or hazel-nuts as being produced by scabies.

cisely similar portions of the cast-off skin of the acarus, and think that the recognition of them is likely not unfrequently to aid in the diagnosis of scabies.

The following case, which in the report is entitled one of "*Bullous Inflammation of both Feet*," was admitted into Philis Ward, under the care of Dr. Rees, during last summer, about the time when public attention was being drawn to the production of similar affections by wearing stockings coloured by means of "coralline dye." No such cause could be discovered in this instance, and it therefore suggests that this explanation should not be adopted in all cases, merely because no other way of accounting for an eruption of bullæ on the feet may present itself.

CASE 3.—(Reported by Mr. W. BUCHANAN.)

"G. D —, æt. 19, was quite well until the 12th of July, 1869, when he first noticed intense itching of the soles of both of his feet. On the 13th some large blisters appeared on his feet, which became red, painful, and much swollen. He had had a tepid bath two days before, but he is sure that this was not hot enough to do him harm. He had worn no coloured socks.

"On admission he presented a large bulla over the dorsum of the right foot, and another over the little toe, and another large one on the inner side of the same foot. On the right foot there were two large irregular bullæ, extending one along the inner side the other along the outer, side of the foot. The feet were œdematous, and presented numerous red puncta, some of which did not disappear on pressure."

By July 22nd the blisters had entirely dried up, and on July 26th he went out well.

No cause for the disease could be made out in this case. The question whether he might have produced the eruption artificially was duly taken into consideration, but no evidence whatever presented itself in favour of such an explanation. Should the disease be called pemphigus?

In certain parts the vesicles of eczema are apt to run together, and to form accumulations of fluid of considerable size which could not be called otherwise than by the name of bullæ. That this occurs in the palm of the hand and on the fingers was long ago noticed by the late Dr. Addison, and we have a model in the museum to illustrate the fact (model No. 94). It has also recently been mentioned by Hebra.¹

From the descriptions of the bullæ of pemphigus given in works on skin diseases it would appear that these bullæ are invariably formed as such, and increase in size by spreading at

¹ 'On Diseases of the Skin,' Trans. of the Syd. Soc., vol. ii, p. 95.

riphery. It therefore ought to be quite easy to distinguish from bullæ produced, as in the case last referred to, coalescence of a number of distinct vesicles. I am by no means sure, however, that this distinction will be found to hold when submitted to the test of clinical observation. Every point was raised by the following case, of which a drawing now in the Museum of the Hospital, was made by Mr.

CASE 4.—(From notes of Mr. J. BURROUGHS.)

Æt. 26, a servant, in not very good health, came as an out-patient December 1868. On the 8th of December a red rash appeared on the front of her hand and soon extended upwards as far as the middle of the forearm, and down nearly the whole of the palm. Two days afterwards, five or six large vesicles appeared on the palm. Mr. Goodhart saw her, and says that they looked like one of herpes. Subsequently the vesicles ran all together, formed a large bleb, and a smaller one. The former measured $2\frac{1}{4}$ inches by $1\frac{1}{2}$. They both broke on the same day (December 21st). The cuticle forming gradually became dry, and horny, and brown. No fresh bullæ afterwards.

The patient said that five years ago she had a large bleb on the right wrist. In Christmas, 1865, a similar bulla appeared on the left palm. In February, 1866, she had one on the right hand.

In this case, again, the possibility that the patient might have scratched herself purposely was, of course, taken into account, but her appearances were not really consistent with such an assumption.

Is the disease pemphigus, or not?

Not only the same question was discussed, with reference to the following case, which was lately under my care.

CASE 5.—(Reported by Mr. W. T. P. DOUGLAS.)

Æt. 45, was admitted into Miriam Ward under Dr. Fagge, September 22nd, 1868. She had been healthy until four months ago, when she was bitten by a pony on the right upper arm. The clothes were torn, and the skin was excoriated both on the front and on the back of the arm. The place in front healed, but that on the back remained painful and indolent, and (she says) after the lapse of a month began to form a raw sore. A month or more later (two months ago) small vesicles appeared on the hands and arms, commencing on the little finger of the right hand.

About the same time vesicles, closely set, appeared on and beneath the feet, the feet became affected with a similar vesicular eruption. The patient is a well-nourished, healthy looking woman. On the right side of the face there is a small patch, covered over with a dry scab. On the chin, and beneath the jaw, there is another patch, about the size of half-a-crown, also covered with a dry scab. On the back part of the right upper arm there is an oval patch four inches in its long diameter and two inches across; the margin of

this is red, and in its centre the cuticle is exfoliating in large pieces (this is one of the spots at which she was bitten by the pony). Both arms, and the backs of the hands, are covered with small papules, mostly distinct, but some aggregated. On the palms of the hands, and on the wrists, there are vesicles, filled with clear fluid, together with some bullæ, rather less in size than threepenny-pieces; between these and the vesicles there are all gradations. One or two on the wrist are filled with a milky-looking fluid, and are more painful than the others. Between the fingers the vesicles are in part distinct, in part aggregated together, so as to form compound bullæ. On the feet the blebs are larger in size, and more of them are filled with the milky fluid. They are situated especially where the skin of the sole joins that of the dorsum of the foot; the plantar surfaces being free, except on the inner sides of the feet. Others are seated on the toes. There is a most offensive smell about the feet.

"Elsewhere the surface of the body is free.

"Beyond the fact that (in addition to fourteen children) she had had four miscarriages there was nothing to suggest a suspicion of syphilis.

"The urine was of sp. gr. 1009, and slightly precipitable by heat and nitric acid, containing some granular casts, epithelium, &c."

She was ordered Liq. Arsenicalis \mathfrak{mij} ex Aq. t. d., and she had a warm bath on her admission.

She quickly recovered, and left the hospital on October 8th. No fresh bullæ have shown themselves. The patches on the left forearm gradually assumed the character of eczematous patches, and (if the patient had been then seen for the first time) the case might easily have been regarded as one of eczema.

A case almost precisely similar to this, in a child four years old, has lately been recorded by Dr. Gee,¹ under the title "Acute Pemphigus." In it, as in the case just recorded, the blebs were made up of confluent vesicles.

If, as I cannot but think, these cases are sufficiently similar to ordinary pemphigus in their course to require to be included under that title (and I do not know on what principle they could be excluded), their inclusion would certainly favour the view that the case of bullous inflammation of the feet, described at p. 334, was also an example of this disease.

At any rate, it is certain that in these cases the affection does not differ in character from ordinary pemphigus, more than in another form which is unquestionably a variety of this disease. I refer to the form described by Hebra as *p. serpiginosus*, which the following case is an example.

CASE 6.—(Reported by Mr. E. ELPHICK.)

F. S—, æt. 13, admitted into Stephen Ward, under Dr. Wilks' care, October 1864,

¹ 'St. Bartholomew's Hosp. Rep.,' 1869, v, p. 119.

1867. He presented an eruption on both legs. This consisted of large reddened patches, covering a large part of the leg below the knee. Towards the edges of these patches, which were irregular in outline, there were several vesicles, about as large as peas, flaccid, and running together into irregular blebs. Some of the vesicles had dried up into brown crusts. The skin over the patches themselves was peeling off. There was some itching.

The left leg was also much swollen, and pitted on pressure; the right leg less so.

The appearance presented by the affected parts was thus very peculiar. It bore a certain general resemblance to the swollen eczematous state of the lower limbs, which is so common in persons of advanced years; but the large irregular vesicles which existed along the borders of the patches were quite different from anything that is seen in such cases. The vesicles themselves were just such as the older writers would have said to be characteristic of herpes; about as large as split peas, round and full, often running together, so as to form bullæ of irregular outline.

The boy looked pale and thin, and rather as if he had some renal disease. The urine was therefore repeatedly examined, and on one occasion a trace of albumen was found in it. Its sp. gr. was 1013.

The boy stated that he had been liable to the disease for about four years. At first it came out in small blisters, about $\frac{1}{2}$ inch in diameter, principally on the legs, but also about the mouth. These blisters burst, and scabbed over, and then healed. Ever since that time crops of them have been successively coming out.

There was at first considerable doubt as to the nature of the disease in this case. It appeared, however, that the boy had, for a considerable time before his admission, been attending as an out-patient under Mr. Cooper Forster's care; and Mr. Forster stated that, in the first instance, the eruption had been one of ordinary pemphigus. The conclusion was therefore arrived at that the case was one of pemphigus in a modified form.

The results of treatment were such as to confirm this opinion. In the first instance local remedies only were used, and failed entirely. On November 5th the legs were covered with ung. metallorum, spread on lint, strips of plaster being also applied from the toes nearly to the patella on each limb. The application gave rise to a good deal of pain. On November 7th the strapping and lint were removed; the patches were much less red and inflamed, but a considerable number of fresh vesicles (bullæ) had formed, and superficial ulcerations marked the sites of some of the older ones. On November 8th, therefore, it was directed that the legs should be strapped again with ung. plumbi subacet. This gave some pain, but less than the other ointment. On November 11th, when the surface was again exposed, the area diseased appeared decidedly diminished; but fresh vesicles or bullæ had formed of considerable size, and some containing a purulent fluid. On the 12th the legs were again strapped up, over lint soaked in lotio plumbi. This produced no effect; and on the 15th, while lead lotion was still used to the right leg, the left leg was treated with a solution of acid. carbolic. \mathfrak{z} ij in ol. olivæ \mathfrak{z} ij. The dressings were next removed on the 18th. The two legs presented little, if any, difference, but the left had been the easier. The carbolic acid was now applied to both legs until the 21st. The surfaces looked much more healthy than at first; but fresh vesicles continued to be developed, whatever the application used.

On November 21st the administration of liq. arsenicalis was commenced in \mathfrak{m} ij

doses. All local treatment was ordered to be discontinued. On November 26th it is noted that "the legs have much improved in appearance. Most of the vesicles have scabbed over, and the general surface of the affected parts appears almost healthy. There are no fresh vesicles." The change effected by the arsenic within five days was extraordinary.

By November 30th the legs presented almost a natural appearance, most of the scabs having separated, and even the redness having almost entirely disappeared. The left leg, however, was still slightly swollen.

Early in the second week of December he complained of headache, sickness, and pain at the epigastrium. The medicine was therefore stopped on the 12th. He had also a little sore throat.

On December 20th some fresh spots again came out over the left ankle, and on the penis and scrotum. These all died away, but on December 24th some fresh vesicles appeared on the genitals. There was now a diseased surface of considerable extent, covering the scrotum and penis, presenting redness, excoriation, recent vesicles, and crusts. Mr. Towne saw the case on the 27th, and a model was made.

On January 4th, 1868, the arsenic was resumed in three-minim doses. It appeared to have an immediate effect. The vesicles rapidly scabbed and dried up. A little powdered starch was kept applied to the affected part. A gland in the groin became swollen and painful, but after a few days this subsided.

Subsequently the dose was gradually diminished, at first to mij , then to mias , and on February 3rd to mj , t. d. A slight outbreak was threatened on January 22nd near the angle of the mouth, and on January 27th on the left leg; but these quickly disappeared. The patient's appearance improved; his face acquired more colour, and on December 10th he went out apparently cured.

He now began to attend as an out-patient under my care. I was anxious to see whether the arsenic, if continued, would prevent the return of the disease. On February 11th, therefore, he was ordered *Liq. Pot. Arsen. mj ex Inf. Gentian. co, t. d.*

On the 25th, as he remained apparently well, the dose was diminished to mas t. d. He continued to take this regularly until March 17th. About March 12th, however, a characteristic vesicle or bulla appeared on the penis, and one or two others subsequently. These quickly died away; but on the 17th the dose of *Liq. Arsenic.* was increased to mj t. d. This, however, did not prevent the return of the disease, for three days later it broke out again.

On March 31st there were several recent vesicles, of the usual herpetic character, on the penis and scrotum. The surface was inflamed, red, and excoriated. There was also a red excoriated patch on the adjacent part of the thigh. He was now ordered to take *Liq. Arsenicalis mj t. d.*

On April 14th he left off taking his medicine, and the disease broke out again on the left ankle, as well as on the scrotum and penis. He was, therefore, ordered to resume the arsenic on April 21st.

On May 5th there was a bleb as large as a sixpence above the ankle, and several of the ordinary patches. The disease had also appeared on the right leg.

On May 19th the patches above mentioned were growing larger, and vesicles had appeared on the penis. He continued to take the arsenic in mj doses. On the 26th he was nearly well.

In the middle of June, and again in July, a few vesicles appeared on the scrotum,

but quickly subsided. The leg was well, except that a good deal of staining remained where the eruption had existed. He persevered with his arsenic steadily till August 11th, and again from September 1st to the 29th.

About the middle of October the disease reappeared in the right thigh; he had also some spots on the left leg, and one or two glands in the left groin became enlarged and inflamed. He was, therefore, again admitted into the hospital under Dr. Wilks' care, when Mr. Alfred Ashby made a report of his case.

The patch on the right thigh covered about the middle third on its inner surface. The affected part was of a bright red colour, with slight elevations on the surface where scabs had been, and it still presented some large raised crusts.

He was ordered Liq. Arsenicalis \mathfrak{mij} ex Aq. t. d. The urine was again examined, and found to be of sp. gr. 1026, free from albumen. He quickly improved, and was discharged on November 17th.

The perusal of this case will, I think, sufficiently show how markedly its appearance deviated from that of an ordinary pemphigus. The diagnosis of such forms of the disease is not without importance, as will appear from the following case, in which the presence of peculiar herpetic-looking vesicles on the genital organs enabled the real nature of the affection to be recognised.

CASE 7.—*Pemphigus*.—(Reported by Mr. P. KINGFORD.)

E. T—, æt. 7, admitted into Lydia Ward, under Dr. Rees' care, May 13th, 1868. She had always had delicate health, and it was stated that for three years in succession an eruption similar to the present had come out each spring and summer.

On admission the buttocks and thighs were sprinkled over with "spots varying from the size of a sixpence to that of a threepenny-piece, some of which had thick crusts over them; but the larger number had more the appearance of a blister." The labia were red and swollen, and presented some "herpetic-looking" vesicles and scabs. The rest of the body was free from all eruption.

She was ordered Pulv. Rhei c. Cal. gr. x statim, Mist. Rhei co. \mathfrak{z} ss bis die.

May 20th.—"Some new pustules have come out on the buttocks, rather smaller than split peas, each surrounded by a very wide areola. The labia are healthier than they were, but at least one new vesicle exists on them."

The eruption in this case presented no very marked characters, and might easily have been mistaken for an ecthyma. I was, however, struck with the diffused swelling and redness of the vulva, resembling so closely the state of the penis and scrotum in the case of W. S—, above recorded. I therefore formed the opinion that the case was one of pemphigus, and this was confirmed by the mother's statement that the child had had attacks of the same disease for three years in succession. The diagnosis soon received its confirmation, for on the 26th May a large bleb appeared, "the size of a half-crown, or rather larger," on the outer side of the right thigh, surrounded by a narrow red ring. After this the disease quickly subsided, and the child was discharged on June 17th.

On September 9th, 1868, she was readmitted into Esther Ward under Dr.

Habershon with a relapse of the disease. Bullæ were then scattered over various parts of the cutaneous surface; several were to be seen on the left leg, one as large as a shilling. On the face were several yellow crusts, and on the fingers a few more, the remains of bullæ which had broken. The vulva was greatly swollen and reddened, and presented crusts and vesico-pustules. Others were scattered over the gluteal regions. The chest and the abdomen were quite free.

Besides the bullous eruption, this child also displayed on admission a roseolous rash, not unlike that of measles.¹ This consisted of slightly raised red maculæ, some isolated, some running together. It was very abundant over the backs of the fore-arms and on the legs. On these it occupied the spaces between the bullæ.

By September 10th the roseolous rash had disappeared from the hands and arms; it still remained on the thighs. Dr. Habershon prescribed a mixture containing five grains of the ammonio-citrate of iron with a drachm of lemon-juice, three times a day, two ounces of wine daily, and a lotion of equal parts of decoction of poppies and lead lotion, externally.

A few bullæ subsequently appeared on the right leg, and some about the anus. However, she quickly got well, and was discharged on September 27th.

I have already, under the head of ichthyosis, made some reference to the disease known as pemphigus foliaceus. This is generally said to be characterised by the flaccidity and small size of the bullæ, as well as by its universal distribution and fatal course. That the characters first mentioned are not in themselves sufficient appears from the following case, which terminated favorably enough.

CASE 8.—*Pemphigus*.—(Reported by Mr. W. L'HEUREUX BLENKARNE.)

M. K—, æt. 69, admitted under Dr. Wilks' care July 8th, 1868. She stated that she had felt poorly for three weeks. She first had an abscess under her left arm, which burst of itself. After this she noticed an eruption, which came out on the left shoulder, and gradually spread. She had had poor living, and on admission was rather emaciated. No exact notes of her condition were taken in the first instance, but she was ordered to take Liq. Arsenicalis $\mathfrak{m}\mathfrak{v}$ ex Aq. t. d.

On July 13th it is remarked, "She says that no fresh bullæ have come out since her admission, but on examination of the abdomen at least one flaccid bleb is seen, containing sero-purulent fluid, and evidently recent. On the neck, chest, abdomen, axilla, and bends of the elbows are large, irregular reddish-brown patches, covered with large flakes of cuticle peeling off. These are horny to the touch, and are in part formed from dried secretion. There are also round spots of different sizes with similar horny coverings—in fact, dried-up bullæ. The face is quite free, and the back nearly so. On the legs the eruption consists only of isolated red spots, on the centres of which the cuticle is slightly horny."

Under the arsenical treatment she quickly recovered, and was discharged August 7th, 1869.

¹ The co-existence of a morbilliform rash with an eruption of pemphigus has been described by Dr. Gee in the 'St. Barth. Hosp. Rep.,' vol. v, 1869, p. 119.

RHINODERMA.

I am generally extremely unwilling to create a new name, or to add a new disease to our nosological list. But when the only names for an affection are such as to suggest for it analogies which are false, and when it presents features strikingly different from those of all other diseases, there is, I think, reason sufficient for giving to it a name of its own. Such is the case with the disease which is generally known as "pityriasis pilaris," a name given to it by Devergie. In this affection the skin is rendered rough, like a *rasp*, by the presence of horny accumulations in the mouths of the hair-follicles. I therefore propose to call it *Rhinoderma*, from the Greek word *ρῑνῆ*, a rasp or file.

The two following cases perfectly illustrate the characters of this affection in a severe and in a mild form respectively. It is only necessary for me to draw attention to the fact that the palms of the hands and the nails were attacked in the first case. This association of the disease with "psoriasis palmaris" was long ago pointed out by Devergie. It shows that rhinoderma is not a disease confined to the follicles, but that it is a scaly affection of the skin generally. I cannot see, however, that it bears any relation whatever either to psoriasis or to any of the recognised forms of pityriasis.

CASE 1.—(From the report of Mr. E. F. GAITSKELL).

John T—, æt. 36, a porter, was admitted into Stephen Ward, under the care of Dr. Habershon, October 2nd, 1867. About four years before, he had been first attacked by a cutaneous affection, which came out gradually over his body. He was then in the Clinical Ward under Dr. Barlow's care, and at the end of two or three months he was discharged nearly well. Occasionally afterwards he had a little of what he calls "scurvy;" but he remained well until fifteen months ago, when the present eruption began to appear. The patient has generally lived pretty well, except when work was scarce. He has at times drunk a good deal. Fourteen or fifteen years ago he had a running from the urethra, but this soon got well. He had no bubo.

On admission a large part of the integument is affected with a scaly eruption, which in some places is diffused over the skin, while in other places it is localized in the hair-follicles. The latter condition is very marked on the backs of the first phalanges of the fingers. All of these present numerous little hard points, many of them black, but some whitish or yellowish. With a glass these are seen to be made of concentric rings, apparently formed of successive layers of the lining membrane

of the follicle. They are easily picked out as little hard grains.¹ Similar rough points are numerous on the back of the hand and on the left forearm, but in these situations they are of smaller size than on the fingers. They are much more abundant on the extensor surface of the left forearm than on the flexor surface. Just below the left elbow they are closely aggregated together, but not so as to form a patch. On the upper arm they are more scanty. The trunk of the body is nearly free from them. The thighs are generally covered with them, except where the more diffused condition, afterwards to be described, is present. The outer surfaces of the legs have them in an extreme degree, the inner surfaces much less so. The backs of the feet are quite free from them.

Many parts of the cutaneous surface also present large patches, in which the skin is somewhat thickened, reddened, rough, and forming branny scales in large quantity. These patches are often remarkably well defined, passing quite suddenly into healthy skin at their edges. The patches themselves contain a large number of the hard points above described. Thus, it would seem that they consist of a scaly disease of the general cuticle (undistinguishable from a dry eczema or a diffused "pityriasis"), superimposed upon the peculiar affection of the hair-follicles. Round the edges of the patches there are sometimes to be seen a number of the isolated horny points above described, but in some places this is not the case. The right forearm presents a large well-defined patch on its outer aspect; and the front of the forearm, on to which this patch does not extend, is clean and free from the follicular affection which exists on the corresponding part of the left forearm. Another such patch exists on the back of the neck. Large ones cover great parts of both thighs, passing up over the trochanters, and down to the inner sides of the knees. There is also a rather ill-defined patch on the lower part of the abdomen.

There is abundant evidence that the general cuticle itself, independently of the hair-follicles, is affected by the disease. The palms of the hands are in a condition closely resembling an ordinary psoriasis palmaris, the cuticle cracking and peeling, so as to form plates of considerable size. The whole palms present this appearance, and the corresponding surfaces of the fingers, except just over their pulps, where the skin is comparatively healthy. The soles of the feet are universally and still more markedly affected in a similar way. On the back also there are slight scaly spots, without any thickening of the derma, and a few similar ones are to be seen on the chest and abdomen.

The finger-nails are all much thickened; on the surface, however, they are smooth, presenting only indistinct striæ. The toe-nails are likewise very thick and discoloured, but still remain smooth.

The hair appears quite natural, and the scalp is free from scales. In the beard is a scaliness, like that of a dry eczema, and fine scales fall off from it into the patient's coat. The skin of the face also is reddened, and the nose is peeling as if touched by the sun.

There is a good deal of itching, especially at night.

He feels quite well, excepting for the eruption. He very rarely perspires. He

¹ They were examined microscopically, but I have unfortunately mislaid the notes which I made at the time.

only once or twice in the whole course of the past summer, and then a small surface on the front of the chest.

repeatedly tested, contains no albumen; sp. gr. 1030.

In this instance he was ordered *Liquor Arsenicalis* ℥iij ex *Decoct. Sarsæ* lotion containing *Sodæ Hyposulph.* ʒss, *Glycerini* ʒiij, *Spir. Rectif.* ʒiij,

The chief alteration observed under this treatment was that cracks on the palms of the hands, between the fingers, and elsewhere. Subsequently a warm bath twice a week. After he began the baths the hands appeared to be rather freer from scales, but at the end of a fortnight a crop of new ones came out, scattered over some of the patches, and the baths were then discontinued. The itching continued to be very severe; and on December 14th he was ordered to apply some *Ung. Sulph.*, which appeared to allay it somewhat. He remained in the hospital until February 19th, 1868, when he left unrelieved. Since that time he has been lost sight of.

In the case just recorded the disease had reached a degree of severity which is very rarely observed. It was probably induced by the arsenic.

In the following instance it had only just commenced, and was not absided, or was cured, under no very protracted course of treatment.

—Emily D—, æt. 15, came as an out-patient under my care, June 11th, 1867. In the last three months she has suffered from a cutaneous affection, which is seated on the hips.

At the present time the disease exists on the outer side of each thigh, from the knee downwards, and there is a patch on the inside of the left knee. In the presence of a number of horny points, of which the position evidently corresponds with that of the hairs of the affected parts, and which give the surface a rough like that of a rasp. There is a good deal of itching at night, and the patches then become red."

She was ordered to take *Vini Ferri* ʒij bis die, and to apply a lotion containing two grains of chloride of mercury to the ounce of water.

23rd decided improvement was observed. The lotion was now changed to equal parts of glycerine and water. On July 30th a lotion of equal parts of glycerine and lead lotion was prescribed.

At 20th it is reported that "the regions affected are smaller, and the skin less rough." No further notes of the case were taken.

Accurate models of the disease were taken from these cases at the Museum, and are now in the Museum.

LICHEN PLANUS.

The name was invented by Mr. Erasmus Wilson,¹ and has been applied by him to designate an affection which appears not to have been hitherto described, and which certainly seems to be regarded as a distinct and independent disease.

Diseases of the Skin, 6th edition, 1867, p. 190. 'Journal of Cutaneous Medicine and Surgery', vol. iii, No. 10, 1869, July, p. 117.

It consists in an eruption of broad flat papules of crimson-red colour, and having a smooth, shining, "glazed," or "burnished" surface. The papules are very little raised above the level of the skin. They are at first distinct; but after a time, as they increase in number, they cohere together. Thus, Mr. Wilson describes them as running into round or oval patches. I have rather seen them form lines of irregular outline, which meet and give rise to a sort of network or pattern over the surface affected with the disease.

Mr. Wilson describes the centre of the papule in lichen planus as showing, through the horny cuticle, the aperture of a follicle. This I have not been able to observe in my cases.

A principal character of the papules in lichen planus, besides their flatness and colour, is their shining glassy surface. The cuticle over them is continuous at their margins with that of the healthy skin; it has no tendency to separate or form scales.

The eruption is rather more common in women than in men. Mr. Wilson gives a proportion of twenty-seven females to three males. It occurs chiefly in adult life, most commonly between the ages of forty and fifty years.

It is not generally attended with much itching; the patient often becomes aware of its presence only by seeing the spots on the skin.

Certain parts of the body are much more liable than others to this affection. These are named by Mr. Wilson in the following order—the front of the forearms, especially above the wrists; the hollows of the loins; the lower half of the abdomen; the hips; around the knees, particularly over the vastus internus muscle on each side; the calves of the legs; and, in women, around the waist and in the grooves occasioned by the garters. It is also described by him as occurring, more rarely, on the palms and soles; and in two instances he has seen it on the tongue and fauces.

The treatment which Mr. Wilson states to be most effectual consists in the administration of tonics, especially the nitro-muriatic acid, and subsequently of arsenic. Locally, he applies a solution of bichloride of mercury (gr. ij—3j) in emulsion of bitter almonds.

The tendency of lichen planus, when submitted to treatment, is to subside after a few months or a year or two. It leaves

brown stains of a peculiarly dark hue, spoken of by Mr. Wilson as "*melasmic*."

Within the last two years models of two cases of lichen planus, by Mr. Towne, have been added to our Museum. The following are the notes of these cases made at the time.

CASE 1.—E. B—, æt. 45, came as an out-patient under my care, November 26th, 1867. She says that she was quite well until a month before, when, after washing, a slight rash appeared above her wrist. This was perfectly dry. On the front of the left forearm are shining papules of a purplish-red colour, cohering together into flat masses. Several similar papules are scattered over the right forearm, both in front and behind, and others are seen on the backs of both arms.

She was ordered to take Mist. Rhei comp. ʒj bis die, and to apply a lotion containing two grains of the bichloride of mercury to the ounce of water.

On December 3rd the Mist. Quinæ was substituted for the Mist. Rhei co.

On December 10th it is noted, "She has been decidedly getting worse. The characteristic red flat papules are now most marked on the backs of the hands. On the forearms they have coalesced into larger livid purple patches. At the bend of the left elbow are several linear elevations, looking very like raised scratches, covered at their summits with whitish lines. On the abdomen and thighs are several livid spots, of very ill-defined character, but having scales upon them. There are none on the knees.

"The eruption has itched all along."

She was now ordered Liq. Arsenicalis mīij ex Infus. Gentian. t. d.

She did not again appear among the out-patients, and as her address unfortunately was not taken, it has been impossible to ascertain what course the disease has run in her case.

In the following case the affection was distributed in a most remarkably linear manner.

CASE 2.—E. L—, æt. 31, came among my out-patients for the first time on June 18th, 1867. She says that she is always weak, and has not very good health. She is nursing her youngest child, who is nine months old. The eruption began six weeks ago on the wrist. It seems to have first appeared in the form of flat papules. It has gradually extended up the arm, and has recently reached the chest.

"Along the inner side of the right forearm is a line of scattered flat papules, many of which cohere into patches covered with slight scales. Beginning immediately above the wrist, the line runs upwards to the inner side of the biceps muscle. On the ulnar side of it is a second group of scattered papules, running up to the internal condyle. Along the upper arm the papules are much finer and more scattered; but they are still arranged in a linear manner. The affection courses along the anterior fold of the axilla, and passes downwards and inwards to the middle line, near the ensiform cartilage. On the chest the papules are still finer than on the arm, and they are shiny in appearance, so that the eruption suggests the notion of a 'dry zoster.' The back is free.

"On the left forearm there are a few similar papules on the radial side, near the wrist.

"The eruption is very irritable, not more so by night than by day."

She was ordered Mist. Ether m. ss. and on June 28th this was changed for mixture containing ℥ss. Sulph. gr. j. ex Mist. Quina. t. d.

July 1st.—The eruption has—The eruption is much the same. It is now observed that the papules extend above the joint to the root of the ring finger of the right hand.

She was now ordered to apply a lotion containing four grains of bichloride cam. mercury and two drachms of dilute hydrocyanic acid to four ounces of water.

July 1st.—There is now no itching or stinging, except when the lotion is applied. No new papules have appeared. The old ones are paler and less raised. The papules above the left wrist are now scarcely to be seen. The improvement is quite marked. To continue the same treatment.

July 1st.—The eruption can now scarcely be felt above the surface, and the redness has much diminished. It has entirely disappeared from the left forearm. She complains of pain under the arm, running through the shoulder, and this is worse when she is sleeping.

CASE 3.—A M.—et. 33 a married woman, who has had twelve children and five miscarriages, came as an out-patient to Dr. Fagge, July 28th, 1868. About ten weeks ago she first became affected with the eruption, which appeared on the arm, and then on the legs in the form of red flattened papules, with a shining surface. These have gradually spread and formed patches. At the present time the rash extends more or less over the whole body, but especially on the forearms and backs of the hands. It has something of the appearance of a psoriasis. The papules are raised above the level of the skin, are of a pinkish colour, and have a flattened shiny appearance, which is very striking, and looks as if their surface had been burnished. Some of the patches are slightly scaly. There is very slight irritation, which is most troublesome at night, when the patient gets warm. It is then rather a burning than an itching sensation. The elbows are not specially the seat of the eruption. On the inner sides of the knees there are both spots and patches of the disease. Both joints are free from it.

She was ordered Liq. Arsenicalis ℥ij ex Inf. Gestiv. t. d.

August 15th.—The mixture to be repeated with xv doses of the Fowler's solution. As much lotion to be applied to the left arm.

October 13th.—Since the last report she has continued to take the mixture, and has also used the lotion, applying it to all the parts affected with the disease. There is great improvement: the eruption now looks more like an eczema getting well than anything else. The surface generally is infiltrated, reddened, and slightly scaly. Liq. Arsenicalis xv ex Mist. Quin. t. d.

27th.—She goes on improving. The skin is now scarcely at all infiltrated, not very red, and only slightly scaly. It still itches terribly, so that she can scarcely bear it.

December 15th.—The eruption is going away. The arms are perfectly well, but she still complains of the itching. She has gone on taking the medicine up to the present time.

CASE 4.—Isabella W., et. 27, came as an out-patient June 22nd, 1869. The present disease, she says, has existed two months. At first she felt very ill with it. The spots came out on the thighs.

At present there are on the inner side of the right thigh irregular clusters of a livid purple colour, made up of raised papules, and round these are some smaller papules. On the shoulders are scattered papules, smaller than those usually seen in lichen

planus; some of them are covered with blood-crusts. The affection is attended with much irritation, especially at night.

She was ordered to take the Liquor Arsenicalis in *mijj* doses, subsequently increased to *mv*. To apply the Lotio Plumbi locally.

August 3rd.—“There is marked improvement. The eruption on the thighs is less elevated and less vividly red, having more of a brown colour. The affection of the shoulders is also much better.”

24th.—“The improvement still continues. The eruption is ‘intensely brown in colour, but scarcely at all raised above the surface.’”

She was afterwards made an ordinary medical out-patient. When I last saw her, towards the end of November, the stains were losing their defined outline and fading away, but were still remarkably brown in colour.

It will be observed from the detailed accounts of these cases that in almost all respects they bear out the description given by Mr. Erasmus Wilson of the disease. The chief difference is that I have found lichen planus to be very generally attended with a good deal of irritation of the skin; and that the limitation to the female sex has been much more marked in my cases than in Mr. Wilson's, all my patients having been females.

In his published accounts of lichen planus Mr. Erasmus Wilson has suggested that the disease is perhaps the same as the *l. ruber* of Hebra, modified by climate. After a careful study of Hebra's account of the last-mentioned disease, I cannot regard the hypothesis as very probable. If lichen planus be allied to any other recognised form of cutaneous affection, I think it is more likely to be related to psoriasis (*lepra vulgaris*). The first case which Mr. Wilson gives in a list of fifty cases of lichen planus is that of a gentleman, *æt.* 44, who “has leichen planus, which has existed for six months, and is associated with ‘*lepra græcorum*,’ both in a slight degree. The patient belongs to a family of which several of the members have *lepra*; and his son, aged 7, has suffered from *lepra græcorum* for three years.” It must be borne in mind that the “papules” of lichen planus are very different from the pointed or rounded eminences which ordinarily bear that name. Indeed, they would not come under the definition of a papule given by Bateman, as “a small and acuminate elevation of the cuticle, with an inflamed base . . .” They are not at all more raised above the surface than are spots of psoriasis. If we could imagine a psoriasis guttata in which the red base of each spot should be well marked, and in which the

cuticle, instead of forming imbricated scales, should assume horny transparent character, we should have quite the appearance of a lichen planus.

In the following case a "psoriasis punctata" of the lower limbs was associated with an affection very like a lichen planus on the forearms—the favorite seat of the latter disease.

CASE 5.—E. M—, æt. 15, has, "for years and years," had the "scurvy" in the form of dry white patches as big as five-shilling pieces. Scattered on her legs are minute spots, the size of millet-seeds, of a red colour, covered with slight scales. There are a few on her knees.

On the upper limbs there is an eruption of a very different character. The backs of the forearms and hands present papules collected into groups, and cohering so as to form branching lines. The eruption is very slightly scaly. There is some itching of the hands. The flexor surfaces of the forearms have papules similar to those on their backs, but less numerous. The left arm is much worse than the right.

A mixture containing Fowler's solution was prescribed for this patient, and she was directed to apply the lotion of bichloride of mercury (two grains to the ounce) to her left arm. The only further report is that on August 20th she was very much better.

MOLLUSCUM CONTAGIOSUM.

I refer to this disease on two accounts—first, because my friend Mr. Davies-Colley has made some very beautiful sections of some of the tumours taken from a child who was a patient of mine, and has given me a drawing which is copied in a plate appended to this paper; and, secondly, because I am desirous of recording the fact that I have endeavoured to propagate the disease artificially, but without success. It is somewhat remarkable that, although molluscum contagiosum is common enough in London, not one case has been brought into my out-patients' room at Guy's since I have had charge of the department for diseases of the skin. Patients affected with it seem invariably to be told off under the care of the surgeon. The following cases have come under my observation at the Evelina Hospital for Sick Children, and for the notes of them I am indebted to the house-surgeon, Mr. J. F. Goodhart.

CASE 1.—W. M—, æt. 2½, was admitted under my care August 23rd, 1869. The mother said he had had warts on the right side of his forehead since Whitsuntide. One came first, which bled, and then others succeeded it. "One or two have lately appeared round the left eye. Their origin cannot be traced in any way to contagion."

"At present there are on the eyebrow of the right eye five or six small tubercles with smooth and rounded summits. They are somewhat translucent, and look as if filled with a clear fluid. However, on attempting to squeeze out the interior the whole tubercle is detached, leaving a bleeding surface. The growth is solid throughout."

One of the tubercles was removed with a lancet, and, with the blood which came with it, was well rubbed into the skin round the left nipple. Gutta serena was then strapped over it to prevent any interference with the part. The child was kept in the hospital and watched, but no sign of the disease made its appearance.

The tubercles gradually increased in size, especially the more recent ones round the left eye. One or more of the older growths, on the other hand, acquired a rough, papillated character, like that of a wart when the cuticle over it has thinned and its papillæ have become separate and distinct.

On October 12th all the tubercles were removed with a scalpel. They were at once handed over to Mr. Davies-Colley for examination. The raw surfaces were touched with nitrate of silver. The child was soon afterwards discharged cured.

While this child was in the hospital under my care two other patients were shown to me affected with the same disease, who were attending as out-patients under Dr. Kelly, and in whom the history of contagion was distinct.

CASE 2.—W. W—, æt. twelve months. On this child's face there are eight or ten small mollusca, chiefly round the eyes, on the cheeks, and on the alæ nasi. The one first observed came as a pimple under the eye.

For the last month the next child has had a pimple under the eye.

CASE 3.—W. J—, æt. 1½. This child has a rather large molluscum on the right eyebrow. The eldest sister, a girl, æt. 11 years, "had many warts on her face, and has nursed baby very much, who has caught them from her. The child has had them now for six months."

The accounts of these cases might not by themselves go far to prove that molluscum contagiosum (as the disease has long been called) is really contagious. They are given rather as illustrations of the kind of statements which are constantly made by the parents of children affected with the disease, and by which, and the observations of Bateman, Virchow, Hutchinson and others, the contagiousness of this disease appears to me to have been already established. A good résumé of the evidence on this subject has been recently given by Dr. Dyce Duckworth.¹

Against this evidence the failure of my attempt to propagate the disease intentionally on the same child's chest goes, I think, for nothing. Similar failures are well known to occur frequently with favus, the contagiousness of which is indisputable. I am not aware that any previous experiments have been made with this form of molluscum. In the German edition of Hebra's work on 'Diseases of the Skin,' indeed, Prof. Zeissl states

¹ 'St. Bartholomew's Hosp. Rep.,' vol. iv, p. 211.

that the failure of my experiment may have been due to the fact that the mollusca in my patient had a solid structure contained no milky fluid, such as Bateman and others described as constituting the mass of these little tumours.

For the following description of the microscopical character of the tumours in the case of W. M—, above recorded, indebted to my friend Mr. Davies-Colley.

"I have examined several of the small tumours given by Dr. Fagge, and have found them all to be composed of lobules, containing epithelium-cells. From one of which I had hardened with chromic acid, I was able to cut a section which shows clearly its glandular structure (see in the Plate at the end of this paper). The tumour was about two lines in diameter, and had a small depression upon its surface. The section shows that it is formed by a spherical glandular body, lying just beneath the surface of the skin, furnished with a duct which opens into the depression just mentioned. From the circumference of this body septa extend into the interior so as to divide it into compartments, which communicate near the centre with the duct. These septa consist of connective tissue, and the whole of the internal surface of each compartment formed by them is lined with a layer of columnar epithelium. The middle of the compartment or lobule is filled with large oval nucleated cells. Between

no trace of cholesterine, such as is generally found in the secretions of sebaceous glands."

These appearances are quite in accordance with those given by Virchow in a paper on this subject.¹ This writer has accurately described the lobulated character and the glandular nature of the growth which he proposes to call 'Epithelioma Molluscum.' He does not admit that it is due to any affection of the sebaceous glands, believing it to arise in a simple hyperplastic growth of the cells which make up the linings of the hair-follicles. He also failed to discover in the specimen examined by him any fatty matters, such as are ordinarily found in the interior of sebaceous glands. He did, indeed, observe bodies which looked as if they consisted of fat, but their chemical constitution was in reality different.

TINEA FAVUS.

This disease, the *porrigo lupinosa* of Willan, is undoubtedly rare in England, although common enough both in Scotland and in France. In the course of the last two years five examples of it have come under my observation; four at Guy's Hospital (two of them being mother and child), and one at the Evelina Hospital.

These cases are, as I think, of sufficient interest to make it worth while to publish them in detail in these 'Reports.' They are also instructive, on account of the success of the treatment of epilation, which had not, I believe, ever been systematically carried out in the hospital before.

But my principal reason for referring to the subject in this place is to draw attention to a peculiar change in the hairs, which has hitherto been mentioned by scarcely any writers on favus, and has never, I think, been properly described.

Fig. 3 on the plate at the end of this paper fairly represents the change which I am about to describe.

This consists essentially in the presence of a large number of tubes running in the interior of the hair. These tubes vary in appearance at different parts of their length. In the root of the hair, into which they always penetrate, they appear as delicate transparent bodies, slightly wavy in their course, with a well-marked double contour, almost exactly like that of nerve-fibres. These tubes run towards the hair-bulb, and ter-

¹ 'Archiv f. path. Anat. u. Phys.,' 33, 1865, p. 144.

minate just within it, in slightly bulbous, apparently closed extremities. These bulbous extremities of the tubes all lie at nearly the same level within the hair; some may project a little beyond others, but they never advance very far towards the torn end of the bulb, nor have I ever seen such bulbous extremities in the shaft of the hair above the bulb.

The tubes in the shaft of the hair present a somewhat different appearance to that above described. They still retain a more or less distinct double contour; but they have lost their delicate succulent look, and appear dry and hard.

I have plainly seen one of these tubes divide into two branches not far above the root of the hair, these two branches diverging slightly from one another, and running *towards the hair-bulb*, where they terminated in the usual manner.

I have not been able to ascertain in what way these tubes of fungus pierce the hair, but there can be very little doubt that they enter it from the follicle. However this may be, it is quite clear from the description above given that they must have the power of growing indefinitely as tubes within the hair. Their bulbous extremities could not be found invariably to lie at a fixed depth towards the hair-bulb, did not each tube grow downwards at almost precisely the same rate at which the hair itself is growing upwards.

In every case of favus that I have seen since my attention was first directed to the occurrence of these tubes within the hairs, I have found them to be present, even in the case of a little infant 15 months old, who was lately in Mary Ward under Dr. Wilks' care.

Now, I am inclined to attach great importance to these tubes of fungus lying within the hairs, as accounting for the impossibility of curing most cases of favus without the most diligent and careful epilation. I can easily understand that no parasiticide should succeed in penetrating the follicle of the hair itself, so as to reach the soft bulbous ends of these tubes.¹

In the case of Sarah S—, hereafter to be recorded, the hypo-

¹ At the same time it is to be admitted that *à priori* one would have thought it at least as unlikely that a parasiticide could enter the substance of the *nail*, and destroy a fungus growing in its interstices. But, as I have shown in vol. i of the 'Transactions of the Clinical Society,' the hyposulphite of soda is capable of effecting this result, even without the least portion of the diseased mass of nail-substance having been cut away, provided that this remedy be kept continuously applied to the affected part.

sulphite of soda lotion (3j—3j. of water) was kept constantly applied with lint and gutta percha for a fortnight on two separate occasions. It succeeded perfectly in preventing the least manifestation of the disease so long as its use was continued, but within a few days after the scalp was left to itself the characteristic favus-cups made their appearance.

I think it, therefore, evident that these fungus tubes not only possess a very stubborn vitality of their own, but are also able at any moment to form nuclei from which the spores and mycelium of the achorion may be developed. The exact way in which this takes place I have not been able to determine. But in one instance I saw one of the tubes bend suddenly round at right angles, and run directly towards the exterior of the hair. Whether it opened on its surface, I am, of course, unable to say.

As regards the termination of these tubes towards the free ends of the hairs, I have no positive information. In all the hairs that I have been able to examine, the free ends have either been cut transversely or have been split up into an irregular brush of detached fibres. In Harriet J—, lately under Dr. Wilks' care in Mary Ward, the latter was the case. Over the whole of the affected parts the hairs were quite short, terminating pretty uniformly at a distance of about an inch and a half or two inches from their roots. When longitudinal, or rather oblique, sections were made of these hairs, rows of beaded spores were observed lying in them near the surface. I could not clearly make out that these spores lay within the tubes, although there could be little doubt that they were formed from them.

So far as I am aware, Dr. Hughes Bennett¹ is the only writer who has described or figured these tubes in the interior of the hairs. Neither Bazin nor Dr. M'Call Anderson (at any rate in his first edition) refers to them, and I believe that they had not been recognised at Guy's until I pointed them out.

In Dr. Hughes Bennett's figures of them, indeed, they are represented as being much larger than they really are, in proportion to the size of the hair. These figures also appear to me incorrect, in making the tubes regularly jointed—more like strings of sausages than anything else. I have never observed this jointed character, the existence of which, moreover, would appear to

¹ 'The Principles and Practice of Medicine,' 3rd edition, p. 847.

be incompatible with the fact, noticed by Dr. Bennett himself, that water may be seen under the microscope entering the tubes by imbibition, running along them, and breaking up the air in their interior into elongated bubbles.

I have already mentioned that in the case of Harriet J— the hairs which contained the tubes of fungus were about an inch and a half or two inches long. It is, therefore, evident that they do not necessarily make the hairs very brittle, as is stated by Dr. Hughes Bennett; although, no doubt, *some* hairs affected are very brittle, so that it is very difficult to extract them entire. Probably it is this circumstance that renders a rough epilation ineffective in permanently eradicating the disease; for, so far as one can observe, when a hair is removed entire, the whole of the fungus is removed from the follicle with it. The root-sheath is generally very thick under these circumstances, and comes out with the hair, bringing with it any spores which may lie in the follicle.

Most writers on favus mention the fact that in this disease the hairs are dry, dull, and lustreless. This is generally ascribed to the absence of sebaceous secretion. I think it is much more probably due to the fungus depriving the hair itself of the nutrient material that ought to permeate its shaft.

In the case of Harriet J—, besides being thus dull and lustreless, the diseased hairs presented what looked like grain of dust scattered on their surface. Under the microscope each of these grains was found to be made up of a mass of round bright bodies, apparently spores. It can hardly be doubted that these had been developed from the tubes within the shaft. If so, it is easy to see how one hair, containing tubes of the achorion, might rapidly give off spores enough to cover the whole of the head with favus cups.

CASE 1.—Favus; epilation; cure nearly complete.

(From the report taken by Mr. W. P. MALLAM, and continued by Messrs. FLOWERS NICHOLLS, R. RENDLE, SAUNDERS, W. EAGER, and W. A. MARSH.)

"Sarah S—, æt. 11 years, admitted under Dr. Wilks' care, November 2nd, 1867. She lives in Swinford, in Leicestershire.

¹ The early part of this case has appeared in a paper on "Cases of Parasitic Diseases of the Nails," in the 'Transactions of the Clinical Society,' vol. i, p. 77.

"She is a strumous, sickly looking girl, affected with favus in its most severe form. Her hair is cut short, matted together with crusts, and swarming with pediculi. A few crusts project beyond the hair on the forehead. On either eyebrow there are cup-shaped masses of the characteristic yellow colour.

"On the lower limbs, from the hips and buttocks down to the toes, there are scattered masses of favus crust. Some of these are as large as five-shilling pieces; others are just commencing as small circles beneath the cuticle. Many of the larger ones are raised *an inch above the surface of the skin*, forming irregular rocky masses, crumbling away on the surface, of a whitish or dirty grey colour. Entangled in these crusts are the fine hairs of the part, and they are crowded with nits. Others of the crusts present regular concentric circles, raised one above another, like those of a shell.

"The nail of the little finger of the left hand is dry, cracked, of a yellow colour, and looks as if it were split into two layers, in consequence of the superficial portion only extending half way up the nail. The yellow colour is most marked towards the root of the nail, but stops abruptly about an eighth of an inch from the root.

"The girl states that her head became sore between four and five years ago, when the hairs also got matted together, so that they were obliged to be cut short. Afterwards the lower limbs became affected. It is only within the last few weeks that the eyebrows have been involved, and the nail has presented the disease for a still shorter period, only two or three weeks.

"Her parents are healthy, the father being a labourer. Their living varies with his wages, and is sometimes low. She has two brothers and three sisters alive. Her eldest sister, now *æt.* 30, had the same disease on her head some years ago, before the patient can remember; she has now recovered, but with a bald head. Two other sisters, younger than herself, have died with the complaint, having had it all over their bodies.

"The eruption sometimes causes her pain, especially when the hard crusts are knocked against anything.

"For more than a year she has felt ill and has lost her appetite. At times she has great pain in her stomach. She has been under medical treatment, but has had no local applications."

The disease had been regarded as *rupia*, and the treatment had been by tonics, wine, and food. It was because the guardians of the parish made difficulties about the nourishment ordered that the girl was sent to the hospital.

On her admission the treatment first employed consisted partly in the administration of cod-liver oil (3ss t. d.), wine, and food, with the effect of quickly improving the girl's appetite and general health; partly in the use of local measures, for the purpose of removing the crusts and restoring the skin of the affected parts to as healthy a condition as possible. A linseed poultice was applied to the head, and at the end of a week she was allowed to have a warm bath.

In the bath most of the crusts fell off from her legs. To the red patches which were left, as well as to the scalp, she was ordered to apply, on lint, a lotion containing an ounce of carbolic acid to seven ounces of glycerine. Two days later she became very poorly. She was very sick, bringing up a quantity of greenish vomit. She looked pale, was sleepy, and her pulse was 120. Her eyelids were puffy; her tongue was tremulous, with a yellow fur. These symptoms were ascribed to the absorption of carbolic acid from the lotion.¹ Its use was therefore

discontinued for the time, and in two days she was pretty well again. It was not noticed whether the urine was of a black colour.²

From the lower limbs the disease was quickly and easily eradicated. After the removal of the crusts by the warm bath (as above described) a few cups occasionally showed themselves. These were at once picked out, the lotion was applied, and within four or five months the disease entirely ceased to reappear in these regions.

The eyebrows, again, were freed from the disease without much difficulty. The crusts were removed soon after the girl's admission. For a short time fresh ones kept forming, but this soon ceased to be the case, although epilation was never performed.

The treatment required by the disease of the scalp was much more tedious, and was incomplete even when the girl left the hospital, after eighteen months' stay in the wards.

During the first six months epilation was not systematically carried out. There was, in the first place, some difficulty in removing the crusts. However, after a time, crusts and hair were cut off together with scissors, a certain portion being removed day by day. This exposed a red, moist, bleeding surface, to which the carbolic acid lotion was then applied. The scalp gradually acquired more healthy characters. The vertex, indeed, became almost entirely free. The skin on this part was found to be white and cicatricial, and only a few black twisted hairs grew on it. Various applications were used to the head in succession; a mixture of glycerine (3j), borax (5ij), and expressed oil of nutmeg (3ss); the lotion of hyposulphite of soda (3j—3j of water); the lotion of carbolic acid and glycerine (1 part in 8).

On March 16th she was ordered to use the two last named applications simultaneously, one to either half of the head. The left side, to which the carbolic acid was applied, became the more comfortable, and looked more free from the disease.

During February and March, 1868, she was under my care, in consequence of Dr. Wilks having charge of the clinical wards.

On May 14th Dr. Wilks kindly allowed the girl to be transferred into the clinical ward, part of which was then under my care. My clinical clerk, Mr. R. Rendle, then made the following notes of her condition:

"The head is now bald on the top over an irregular surface. The remainder is covered with hair matted together with fungus. At the front part, where the hair is thinner, are several yellow cups, and there is one by itself on the bald patch, having two hairs in the centre.

"The eyebrows are quite clean, and the hairs are growing over the parts which were diseased.

¹ For some cases in which serious and even fatal effects followed the external application of carbolic acid, see the '*British Medical Journal*' for March 7th, 1868.

² In volume xiii of these '*Reports*' Dr. Stevenson published the account of a case in which the urine presented a black colour, which he suggested might be due to a carbolic acid lotion that had been prescribed for the patient. Subsequent observations have shown that this view was correct. The same thing has since occurred in a patient of Mr. Birkett's, in Lazarus Ward.

"The legs are quite free, but there are still marks indicating the former position of the masses of crusts."

She was now ordered to take *Syr. Ferri Phosphatis* 3j—5ij t. d. The hair was cut short; olive oil was directed to be rubbed into the head, and a poultice was applied to soften the crusts.

On May 15th the head was well washed with warm water, under an irrigating apparatus. The crusts came off. Olive oil was then applied.

16th.—Mr. Rendle commenced a systematic epilation of the head, to which he devoted about half an hour daily. The hairs came out easily, two or three at a time, but their removal caused considerable pain. A raw bleeding surface was exposed, but this recovered a natural appearance by the next day. The head was also washed twice a day with the irrigating apparatus, and was gently cleaned with a comb. After a time it was found that the addition of some borax to the water used in the irrigating apparatus was attended with advantage.

By June 30th Mr. Rendle had removed all the long dark hairs on the head, except those over the nape of the neck and over the lower part of the occipital bone. In this region epilation gave very great pain, and the hairs could be pulled out only with much difficulty. On all parts of the head there were some downy hairs. A few isolated cups kept constantly being formed at different points, each with a hair in its centre.

During the next four months (July to October, 1868) local epilation only was practised; but this was kept up with considerable regularity by Mr. Rendle, Mr. Nunn, Mr. Lungley, and Mr. Saunders. Each cup as it appeared was carefully removed by the forceps, and great pains were taken to pull out the central hair; but unfortunately this often broke off. A lotion of bichloride of mercury was applied to every spot from which a crust had been removed. No parasiticide lotion was used to the head generally, as it was thought better to let the disease manifest itself freely wherever there might be a diseased hair to form a starting-point for the growth of the fungus. In this way the disease was kept under without difficulty, but a few cups still kept forming, fresh ones being discovered every few days.

On October 31st it was determined to make a great effort to eradicate the disease by means of the hyposulphite of soda. The head was therefore shaved as closely as possible. The few cups that showed themselves were pulled out, and the usual lotion was applied. Mr. Saunders then carefully covered the whole head with slips of lint soaked in a solution of the hyposulphite of soda, and over this a cap of gutta percha was placed and firmly fastened (so as to be as nearly as possible air-tight and water-tight), by a band of strapping encircling the whole head. A small aperture was made in the gutta-percha cap on the top of the head, capable of being closed with a kind of lid. Through this aperture a fresh supply of lotion was poured in every day from October 31st until November 12th. On this day the dressings were, for the first time, removed. No trace of the disease was visible, and it was hoped that it might be cured. The head was washed with soap and then with borax twice daily.

On the fourth day after removal of the lint and gutta-percha cap one or two cups appeared. These were at once removed.

On the following day (November 20th) the head was again shaved, this time more closely than before. The lint and gutta percha, with the lotion, were again applied in the same way, the lotion being now poured in twice daily. On the 28th

the lint was reapplied. About the 4th December it was again removed, and the scalp was now left bare. No cups showed themselves for four days, and only one doubtful one then, but on December 8th the dressings were again reapplied. A week or two later they were removed, and the head was now left uncovered. In a few days some cups again made their appearance, and by the 1st January, 1869, there were twenty or thirty of them, and some had become powdery. They were most numerous round the middle line close to the forehead. They were all removed on the day named, and all the hair round them, so as to leave a bare, red, oozing surface, to which the bichloride solution was immediately applied.

After this the attempts to destroy the disease by the continuous use of the hyposulphite of soda was given up as having failed. The girl was now directed to wash her head with soap and water regularly, and the ward clerk was requested to continue the practice of removing each crust as it appeared, with its central hair.

On February 2nd the application of blistering fluid was tried for the first time, being used to the frontal region. It did not appear to check the growth of cups within a few days of its application, and therefore, after a short time, it was given up.

On February 25th it is noted that there are now two principal seats of the disease—a spot about the size of a halfcrown on the forehead, and an irregular space over part of the left temporal fossa. For some weeks no cups, it is believed, have been found on the right side, and only a few on the back of the head.

The number of cups found day by day gradually diminished; but on May 8th about twenty cups were discovered, some of considerable size. These were all removed with the hairs around them, and hyposulphite of soda was rubbed vigorously in, after which she washed her head with borax lotion.

On May 14th her parents came to London and removed her from the hospital.

In August I was in Leicestershire, and had an opportunity of seeing her. I found that there was one diseased patch on the vertex, but that the frontal region, which had given us so much trouble, was now quite free, and covered with hair. She was in a very dirty condition again, her head being covered with pediculi.

CASE 2.—*Favus; epilation; permanent cure.*

(Reported by Mr. F. FLOWERS, Mr. W. H. NICHOLLS, and Mr. R. RENDLE.)

"J. B—, æt. 11, admitted into Guy's Hospital, under the care of Dr. Fagge, February 18th, 1868. He is the son of a labourer on Allen's Farm, at Plaxtol, near Sevenoaks. Out of a family of eight, two brothers and one sister have been affected with the same disease as the patient. But they have now good heads of hair, although they never had any treatment for it except that they used to wash their heads with soap, and to rub in salt butter. He himself has had the complaint since he was three months old, but has otherwise been healthy.

"When the boy came to Dr. Fagge as an out-patient the whole scalp, except for about an inch round its border, was covered with a dry, mortar-like crust, mostly of a yellowish-brown colour, but at some spots of a sulphur-yellow. In some places this was one third of an inch thick. No separate cups were to be seen, and the rarity of favus in England might have led to the case being mistaken for one of impetigo, but for the yellow colour which was here and there observed. The microscope was, therefore, had recourse to, and at once settled the diagnosis."

On admission the crusts were readily removable, leaving a bluish-red, watery-looking surface, bleeding at points where hairs had come out. There were no patches of baldness. No pediculi were present. The mousy smell was well-marked. There was at times itching. The cervical glands were slightly enlarged, and there was one, about the size of half a nutmeg, which he said always became bigger when his head was worse. The hairs were dry, and easily pulled out. Under the microscope the crusts were found to contain immense quantities of the spores and mycelium of the achorion, and the hairs were full of the fungus-tubes which have been fully described above.

Scattered over the body were a number of small red spots, some at least of which showed mycelium and spores similar, to those in the crusts on the head. The nails were all healthy.

The boy was rather strumous looking, and had a bad appetite, but in other respects he was healthy.

He was ordered cod-liver oil, and poultices were applied to remove the crusts, after which a lotion of borax and glycerine was applied for a few days.

By March 3rd but few crusts were visible. Systematic epilation was now commenced by the ward clerk, Mr. W. H. Nicholls, a lotion of bichloride of mercury (two grains to the ounce) being applied to the surface cleared, to destroy any fungus that might be scattered about. The operation caused little or no pain on the crown of the head, but on the occipital and temporal regions the removal of the hairs was attended with much pain, and it seemed that at those parts the hairs were healthy.

At the end of a month the head was for the time free from crusts; but over the epilated parts there were merely a few straggling twisted hairs with healthy bulbs, free from fungus. It seemed very much as if the removal of the hair had precipitated the baldness which is so often produced by the disease when of long standing, and the absence of which was perhaps remarkable, considering that the disease was said to have existed for more than ten years.

On May 1st the boy was removed to the clinical ward, and epilation was continued every day by Mr. Rendle, Dr. Fagge's clinical clerk. Besides the use of the solution of corrosive sublimate to the cleared spots, the Ung. Creasoti was applied to the surface of the head night and morning.

It gradually became more and more difficult to find hairs presenting the tubes of fungus in their interior, but the roots of most of the new hairs which had appeared were very imperfectly developed.

By the 22nd of May downy hairs existed over the whole surface of the head. It was hoped that the disease might, perhaps, be cured. The boy's friends were anxious to remove him, and he was therefore allowed to leave the hospital, with directions to come back for inspection at the end of a month. I am not aware that a single well-marked cup of favus had shown itself during his whole stay, and I was under the impression, when he left, that the case presented some peculiarity in the seat of the fungus. It was chiefly the exact resemblance of the diseased hairs to those seen in the case of Sarah S—, above related, which convinced me that the case was really one of favus.

On June 26th he returned. The hair had grown well over the whole of his head, especially at the vertex. It had not been washed since he left the hospital, and was in a filthy state. Small yellow favus cups, each with a hair in its centre,

were scattered all over its surface. Spores were found in these cups, as usual, but the hairs themselves presented nothing characteristic beyond wasting of the root.

The hairs round each cup, and the cups themselves, were at once removed with the forceps, and the lotion of bichloride of mercury was then applied.

On the 10th July it is noted that cups with the central hairs have been removed every few days, as they have appeared. No general epilation has been attempted. The newly grown hairs are matted together with scurf.

On the 20th July "very few cups are now to be seen."

On the 1st of August "only three or four cups are now seen, and these are hidden by the thick scurf, where the hair has grown thickly."

The head was now shaved, so that any cups that formed might be more visible, but there were very few to remove.

On August 19th, 1868, he went home, in order that he might go hop-picking with his family.

He was directed to return and show himself later in the year, but I heard nothing of him, and therefore in January, 1869, I took the opportunity of paying him a visit, and enjoying at the same time a long country walk. I found him at the Sunday school, with a good curly head of hair, well greased and brushed, in a condition very different from the dirty neglected state in which he had been when he first came to the hospital. His mother told me that he was quite cured, but I discovered two small withered, hard, dry crusts on his scalp, which I carried home for examination. Rather to my surprise, I afterwards found that each of these minute crusts contained numerous spores of achorion, and in one of them I was able to determine that the central hair had the characteristic long tubes of the fungus in its interior.

I had questioned the boy's mother as to the possibility of a fresh infection with the disease, and she admitted that a married sister of the boy still had what she believed to be the same complaint, and that he had sometimes been to the cottage where she lived. From the dry, withered appearance of the crusts, however, I am inclined to believe that they were remains of the original disease. How it was that they had not led to the reproduction of the complaint I cannot entirely explain. The boy appeared to be in much better health; and the fact just stated might certainly be used as an argument in favour of the view, that some defect in the general health is necessary to the free growth of favus.

I have lately (November, 1869) heard from the patient's mother that he remains entirely free from favus and has a good head of hair.

CASE 3.—*Favus; epilation; cure (?)*.

(From Mr. GOODHART'S report.)

George C—, æt. 6, admitted into the Evelina Hospital under Dr. Fagge, August 6th, 1869, having previously been an out-patient under Dr. Kelly. He is a healthy boy, but has had a bad head for eighteen months. The mother says that at first many white pimples came on the scalp. There was no discharge; the pimples became larger and larger, and large scabs formed. When these came off—as they did at times—the surface was clean and red, and not moist. Latterly the crusts have had a yellow colour.

On his first appearance as an out-patient the head presented several large irregular crusts, projecting some way above the surface, and with well-defined margins. The larger of these crusts—some the size of a threepenny-piece—were warty-looking; the smaller were smooth, shiny, and depressed in their centres. On removing them a watery depressed surface was left, bleeding slightly. When scraped the crusts exhibited the characteristic yellow appearance of favus crusts, and the mousy odour was observed.

On the next attendance many of the crusts had come off, leaving only patches like those of an eczema. The case was, in fact, said to be merely one of eczema.

On admission the head presented numerous red, dry, scaly patches, very like those of a dry eczema. The hair on these was not much thinner than elsewhere, but the individual hairs were short and very fine. Many of them were also very brittle. Microscopically they showed in their interior the characteristic tubes of the fungus (*vide plate*). The only well-marked favus crust was on one temporal region.

August 8th.—There is a patch on the nose looking like a small favus cup. On the margin of the left ear are some dry scurfy patches.

14th.—Similar patches exist also on the body and legs.

16th.—Epilation was commenced, but is very difficult, owing to the delicacy and brittleness of the hair. The head was ordered to be shaved, and a lotion of bichloride of mercury (gr. ij—3j) was prescribed for application to the denuded patches. All the round patches were directed to be cleared of hair as absolutely as possible. A mixture of cod-liver oil and steel wine was prescribed three times daily.

23rd.—*Lotio Sodæ Hyposulph.* to be applied to the head constantly, with gutta-percha cap.

September 1st.—The patch where epilation was first commenced now seems to be well. The redness is disappearing, and a very fine down is growing over it. All the patches seem to be much better. No cups are anywhere to be found.

15th.—Head to be shaved again. Very little fungus can now be discovered on microscopical examination of the hairs or scurf from the head.

30th.—The head appears to be fast getting well.

October 10th.—All lotions are to be discontinued, and the head rubbed with a lotion containing *Boracis ʒij*, *Tr. Canthar. ʒij*, *ad Aquæ Oss.*

22nd.—Hair growing fast all over the head, but several fresh cups have appeared at the back of the head. The whole head is very scurfy, and there is a tendency to the formation of yellowish crusts, which, however, appear to be formed from dried sebaceous matter, and not to contain any fungus. They are more superficial and more irregular in outline than the cups; they are also of a less bright yellow colour, and are not imbedded in the cuticle in the same way as favus crusts.

November 14th.—Five or six well-marked cups were found yesterday, in which the fungus was very evident under the microscope. For some time past, although several apparent cups have at intervals been found, no spores have been discoverable in them. The only treatment adopted has been the early removal of everything that looked like a cup, and the application of a lotion of bichloride of mercury to the denuded surface.

December 4th.—One or two cups still occasionally present themselves. The round red patches which existed on admission are now much less distinct in outline, and hair is growing over them.

14th.—He has been discharged, apparently cured, no trace of the disease having been discoverable since the last report.

CASES 4 AND 5.—*Favus in mother and child; epilation commenced.*

(Reported by Mr. J. P. ALLWOOD.)

Harriet J—, æt. 22, admitted, under care of Dr. Wilks, into Mary Ward, November 30th, 1869, having been previously an out-patient of Dr. Fagge's. The patient says that she has suffered from the scalp affection, for which she is admitted, ever since she was six years old. She caught it from her brothers and sisters, who first got it at school. The disease has been much worse than it is at present. Her brothers and sisters got quite well of it at about the same age at which she now is, and they now have capital heads of hair. She does not know whether they were treated in any way for it.

The patient is married, and has had two children, upon each of whom she noticed something the matter with the scalp about eight days after birth. The elder one died when a fortnight old, apparently from obstruction of the bowels. The second one, now fifteen months old, has been taken in with her, as it is now suffering from the disease. The mother says that when it first came on the child's head it was like an ordinary ringworm. It remained in this condition until three months ago, when it began to assume its present aspect. The child has always been delicate.

The mother is a well-developed, healthy looking young woman; complains of nothing but her skin affection. A large surface over both parietal regions, most on the right, is covered with yellowish-brown crusts, of varying thickness, with the hairs coming through them. Over the diseased parts the hairs are only about an inch and a half or two inches long, and have a dry and dull appearance, as if dusty. There are no pediculi, nor has the patient ever been troubled in that way. Upon the crusts being removed a red surface is left.

Upon the hair being cut short the extent of the disease is seen to be defined by a very distinct margin.

Upon the head of the child are several yellow crusts with elevated edges. They are situated close together at the vertex. The hair about them, and coming through them, is shorter and duller than that on the rest of the head. The crusts, when broken into, are dry, yellow, and crumbling.

The child is small, and delicate looking.

Under the microscope the crusts and hairs in both cases are found to contain the fungus. The tubes extend quite to the ends of the hairs.

Treatment.—A portion of the surface to be epilated every day. A solution of bichloride of mercury (gr. ij ad Aq. ʒj) to be freely applied to the space cleared, and a lotion of hyposulphite of soda (ʒj ad Aq. ʒj) to be kept constantly over the whole extent of the disease by means of lint and oiled silk. The head to be well washed every day with borax and water.

A few days after this treatment had been commenced, diphtheria broke out in the ward, and the mother and child were therefore allowed to go home, on the understanding that they would return in the beginning of the new year.

Remarks.—I have given these cases in detail, because they

fairly indicate at once the need of perseverance and patience in the treatment of favus, and the success which may be attained when these conditions are fulfilled. The disease is so rare in London that very few clinical records are available showing the results of different methods of cure. Some years ago, however, Mr. J. Hutchinson published in the 'Medical Times and Gazette'¹ a collection of forty-four cases. The general results of his observations was that the disease, when local, could be cured by the application of fuming nitric acid; but that patients affected with extensive favus were traced from one hospital to another, the treatment adopted removing the disease for a time, but being generally insufficient to cure it permanently. In his 'Handbook of Skin Diseases,' Dr. Hillier gives some cases of favus cured by epilation, and others cured without recourse having been had to this procedure. I think I may say that our experience at Guy's has been in accordance with Mr. Hutchinson's statements, that, by the ordinary methods of treatment, without epilation, the cure of favus is generally only temporary, and is apparent rather than real.

¹ Vol. ii, 1859, p. 553.

DESCRIPTION OF THE PLATE,

Illustrating Dr. Fagge's Paper.

- Fig. 1.—Shows the microscopical appearance of a section of a tumour of *Molluscum contagiosum*, as seen by a third objective, magnifying 50 diameters.
- Fig. 2.—Shows another portion of the same tumour, as viewed with one-fifth objective, magnifying 185 diameters. Portions of two lobules are seen, with the septum between them. The characters of the columnar cells at the circumference, and of the oval cells in the interior of the lobules are well defined; and transitional forms between the two kinds of cells may also be observed.
- Fig. 3.—Shows the appearance of hairs filled with tubes of the achorion, in a case of *Tinea Favus*. The specimen is viewed with one-fifth objective, magnifying 150 diameters. At the upper part of the figure, which is somewhat diagrammatic, is seen a portion of a hair near its bulb. The tubes may be observed to terminate in rounded extremities, all situated at about the same level. The rootsheath round the hair is much thicker than natural and outside it are seen masses of spores. In the lower part of the figure is seen the free end of another hair. This is much atrophied, and is rendered opaque by the tubes running through it. Round the cut end of the hair is seen a mass apparently consisting of fatty granules pressed out of its interior. Adhering to the surface of the hair are a few fat-globules.
- Fig. 4.—Shows a portion of another hair (with its rootsheath) from a case of *Tinea Favus*, viewed with a higher eyepiece, and magnified 250 diameters. It is intended to show the double contour of the outline of the fungous tubes, which could not be indicated in the other figure.

Fig. 1.

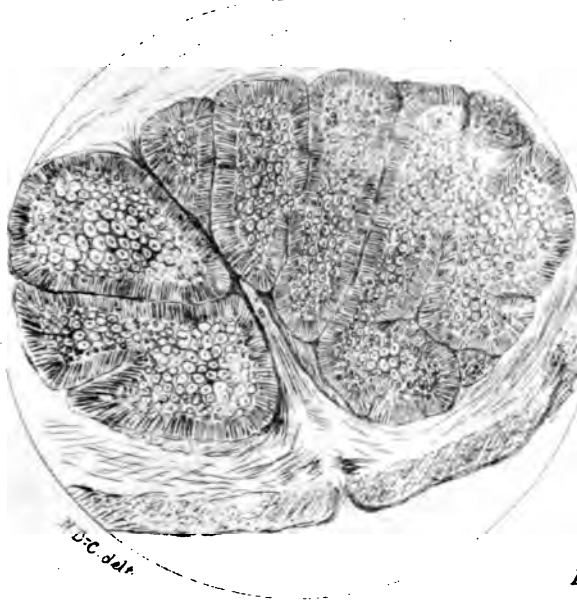
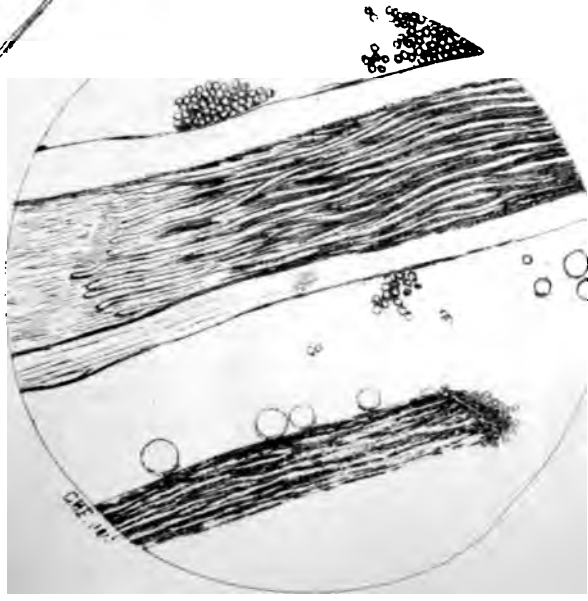


Fig. 2.



Fig. 3.





THERMOMETRIC OBSERVATIONS

IN

CLINICAL MEDICINE.

By J. F. GOODHART,

HOUSE-PHYSICIAN.

(Communicated by the Editors.)

SINCE the introduction of the thermometer as a clinical instrument, regular thermometric observations have been made at Guy's Hospital in a large proportion of the cases of febrile disease that have been admitted into the wards. The evening notes have generally been taken by the house-physician for the most part, those in the morning either by him or by the medical clerk, or by both. Hitherto, however, the 'Guy's Hospital Reports' have contained no reference to these investigations. The Editors have long been anxious that this gap in their records should be supplied, and they therefore gladly availed themselves of the notes placed at their disposal by Mr. J. F. Goodhart at the termination of his house-physiciancy. They have since requested him to give them particulars of the thermometric observations made in some cases of the Acute Erythema and other Diseases of Children under Dr. Fagge's care in the Evelina Hospital. Notes have also been added of a case of the relapsing fever now so prevalent in London, in which the thermometrical observations were made by Mr. J. Taylor, the present house-physician, and by the clinical clerks.

It was said in Laennec's work, many years ago, that the stethoscope would prove useful only in hospitals. The thought which he expressed at that time concerning the stethoscope is as relevant now as regards the thermometer. At the present time many look upon this instrument as very interesting in the study of the natural history of disease, but as a thing of com-

paratively little value for the everyday work of medical practice. It may be that too much was expected and asked of it; that the estimation of temperature as an aid to diagnosis was such a rational idea that no adverse criticism was ever offered on the introduction of the thermometer, and that, at once, without proof or warrant, its advocates were allowed to claim for it a use in every possible disease. From this one extreme we have gone nearly to an opposite, and there are reasons for saying that now, in many instances, the temperature does not guide us as much as it might do, and that auscultation and thermometry do not go hand in hand as they would do had every member of our profession made trial for himself of the latter mode of investigation. Thus much in explanation of this paper. In turning now at once to our subject, it will, perhaps, be as well, since there is much difference of opinion on this point, first to state the *manner* in which the temperatures quoted have been taken. The Fahrenheit scale has been adopted. In nearly all cases, for convenience, the axilla was chosen, and the bulb of the thermometer, inserted between its folds, was held there, the thumb and finger keeping it in close apposition with the skin for *three minutes*. At the end of that time, if the column was not evidently rising, it was withdrawn. In the majority of cases the mercury, at the expiration of the three minutes, will be found, for all practical purposes, to be steady; but to ensure the accuracy of the observation it is requisite that the thermometer should be *held in* for the *whole* period, the index being watched meanwhile to see that it be steadily rising.

It is often stated, on good authority, that this period of three minutes is not long enough, and that the column will not become stationary sometimes for twenty minutes. The exception I take to this is that it does not go far enough. The limit might be extended to half an hour, or an hour, and then the truth would not be attained; indeed, the longer the limit, the farther might we be from strict accuracy. In support of this, the following instances are given.

I. Extracts from chart of Scarlatina.—The temperatures of the 8th, 9th, and 11th days are given, because on these days the observations were made five times in the twelve hours.

	8 a.m.	12 noon	2 p.m.	4 p.m.	8 p.m.
8th.	100°	103°	103·5°	104°	103·6°
9th.	100°	102°	103·4°	104°	103·7°
11th.	102°	102°	103°	104°	104·3°

II. Observations on myself at intervals of five minutes during a period of an hour and a half, a *non*-registering thermometer being used.

After 25 min. in axilla	95·2° F.	After 65 min. in axilla	96·2° F.
30 . . .	95·5°	70, 75 . . .	96·2°
35 . . .	95·6°	80 . . .	96·3°
40 . . .	95·6°	85 . . .	95·9°
45, 50, 55 . . .	96°	90 . . .	95·9°
60 . . .	96·5°	95, 100 . . .	96·1°

Here the result at 60 min. would be incorrect for 65 min., and, again, the temperature at 80 min. is higher than that at 85 min.

From many similar experiments made on these "minor variations," as Mr. Garrod¹ well calls them, I think it ought not to be expected that the temperature of one period should be the temperature of the next, when twenty minutes or half an hour has intervened; and unless this be generally known, the very striving after accuracy may lead to incorrect results.

Again, it has been urged that a prolonged period of observation is necessary when the action of drugs is being investigated, and that here minute variations, usually of no moment, become of importance. But is this so? Would any one, bearing in mind the fluctuations in surface temperature occurring in health, decide in favour of one drug or another, or say in any given case that the remedy was influencing the disease, from the fact that a deviation of one or two fifths of a degree had occurred in the chart subsequently to the administration of a dose? I think not. To allow this, indeed, were to say that the thermometer is useless in general practice—the very conclusion I am anxious to combat. Reference has been made above to Mr. Garrod's paper on minor fluctuations. Attention is again called to it here, because it contains valuable information to which I am much indebted, and because by such observations in health light is thrown upon the ranges in disease.

¹ "On Some of the Minor Fluctuations in the Temperature of the Human Body when at Rest, and their Cause." By A. H. Garrod. 'Proceedings of the Royal Society,' May 18, 1869.

The conclusions Garrod arrives at, from experiment himself may be thus shortly stated :

1. That the fluctuations of temperature in health result from variations in the amount of heat lost from surface of the body by radiation, conduction, &c., then dependent on the amount of blood exposed at the surface.

2. That the variations in quantity of surface blood regulated by the state of contraction or dilatation of cutaneous vessels—by the state, in other words, of tension.

3. That there is, as a consequence, a certain alternation between surface and visceral temperatures; that when surface temperature falls, that of parts away from the surface rises.

These results I have verified by many experiments; the results of which are given.

I.—1.10 a.m. to 3.45 a.m. Temperature of room 67°. Ordinary clothes next skin.

	Mouth.	Axilla.	
1.30 .	97.5°		
1.40 .	97.9°	98.4°	Began to strip.
1.45 .	98.6°	97.8°	
2.25 .	98.7°	96.8°	Covered myself with blanket had a vapour bath.
2.30 .	97.9°	97.4°	
3.0 .	97.6°	99.4°	Bath 82°.

II.—7.45 a.m. to 8.15 a.m. Temperature of room 80°. Clothes on.

	Mouth.	Axilla.	
7.50 .	97.7°	96.4°	
7.55 .	98.4°	97°	
8.0 .	98.6°	96.9°	Stripped and jumped into water 75°.
8.2½ .	99.4°		
8.5 .	99.4°	91°	Got out of bath again. Temp of water now 80°. 2 gallons raised 5°.
8.10 .	98.8°		
8.15 .	98.6°		

III.—Room 68°.

	Mouth.	
2.20 a.m. .	97.7°	P. 80.
2.28 a.m. .		Stripped.
3 a.m. .	97.7°	P. 52 per min.; intermitting.

So far as these experiments go, they quite bear out what has been stated. For instance, in Exp. I and II, as soon as the skin was exposed the surface temperature declined. Now, inasmuch as cold is known to produce contraction of the small vessels, it seems fair to infer that these at once became smaller, and that the quantity of blood going to the surface was decreased. It may also be seen that as the temperature in the axilla declined that of the mouth abruptly rose. This may have been due, as Mr. Garrod thinks, to a rise in temperature of the whole circulating fluid dependent on lessened facilities for the diffusion of its heat. It may, however, have been no more than the natural result of an increased blood-supply to the internal organs.

In connection with this subject it will not be out of place to say a word or two on the cause of shivering, a phenomenon intimately associated with both normal and diseased conditions. It has been stated that rigors are an evidence of a reduction in arterial tension, on the ground that tension being reduced, so much heat is given off from the surface that the temperature of the body is rapidly lowered. But it is no uncommon thing for a person in health to shiver after meals, when the internal temperature is higher than at other times, and when there is no rapid cooling of the body. Again, the shivering in ague occurs when the temperature is far above normal, proving that however rapidly heat may be given off from the body, yet there is no reduction of temperature to cause a rigor. Indeed, if tension has anything to do with it, facts would rather go to prove that rigors are accompanied by an increase, than by a diminution of tension. For instance, in the above experiment shivering came on while the surface was exposed, at a time when arterial tension was presumably increased. A better explanation is one which makes it depend upon a *disturbance of the balance of the circulation*, by which the cutaneous vessels, and consequently the sensory nerves, get less than their proper amount of blood. For if from any cause the viscera are receiving more than their share, the surface must be receiving less. In proof of this may be mentioned the occurrence of rigors at the onset of many acute diseases and in ague; in all of which complaints there is evidence of increased blood supply to one part at the

expense of others. Thus, in fevers and in ague a large is noticed, and in pneumonia the lung takes the place of spleen in requiring a large amount of blood. The ex of shivering after meals is also additional evidence. In scarlatina, where there is a large cutaneous sup blood, rigors are not usually observed, neither is enlargement of the spleen a symptom of this exanthem. Mr. Re Stocker, Registrar at the Hospital for Sick Children, tells that out of ten post-mortem examinations in cases of scarlatina, the spleen was apparently healthy in eight. In one it was both soft and large, in another it was rather soft.

Experiment III is given because it bears on the question of arterial tension, and shows how the contraction of cutaneous vessels, by lessening the amount of heart blood, quickly lowers the pulse. This is further corroborated by what is observed in scarlatina. In this disease, as a consequence (it is supposed) of the greatly increased cutaneous circulation, there is an extremely rapid pulse. It may be urged against this, that the more dilated the vessels the slower ought the circulation to be, according to well-known physical laws; but it must be remembered that *dilation* is here synonymous with *free circulation*, and that *contraction* of the vessels means *obstruction*.

While still upon the subject of temperature in health, it should be stated that the usual range is between 97° and 98·6°, and that while the temperature may often be below 97° without any feeling of illness, any rise above 98° is accompanied by considerable constitutional disturbance.

Lastly, exertion slightly raises the temperature, and a general fall takes place when rest is resumed.

The foregoing observations on normal variations, though accounting altogether for the extremes often met with in disease, still seem to point to the circulation under the influence of nerve influence as the chief agent in their production, on the assumption that normal conditions, exaggerated or perverted, will produce disease. And inasmuch as the condition of the blood to a part must influence in great measure the condition of that part, we should expect that secondary results will be observed, according as waste or wear was increased.

diminished. To explain variations in temperature otherwise than as the resultant of several factors must lead to error, for it is impossible to isolate and discuss one set of conditions without taking others into consideration. If, for instance, increased tissue change be taken as the cause of increase of temperature, one cannot argue for or against this, without going farther back to consider the velocity, &c., of the blood current, as having a probable influence on the waste of tissue, or the agency of the nervous system in controlling the circulation. Moreover, tissue change, as estimated by the excretion of urea, fails to account for this increase of temperature. I state this on the authority of a series of cases of typhus, published by Mr. Squarey in Volume L of the 'Medico-Chirurgical Transactions.' In hardly any instance can I find a rise on the chart accompanied by an immediate increase of the urea in the urine. It is said that, though this is not perceptible at once, the urea is in reality increased *slightly* for some time after the rise, and no doubt this oftentimes is so. But the same thing happens in ague after the administration of quinine, and yet, while the excretion of urea goes on in the same way and to the same amount as it did when the temperature was rising, here we have the rise in temperature absolutely arrested. This is proved by some observations of Dr. Parkes on the urine in ague, quoted in Reynolds' 'System of Medicine.' The excretion from the skin and lungs must then be taken into account, but as in the majority of cases in fever, &c., the skin is doing *less* work than in health, and the lungs are, if anything, doing less rather than more, it may be supposed that they do not take away much from the work of the kidney.

It should be noted also that the hardest exertion, unless continued for a long time as in chorea, does not raise the temperature much more than one degree. In a fatal case of chorea the urine became solid on adding nitric acid from the precipitation of nitrate of urea, but the temperature continued low till just before death, when it rose to 103° . In a case of tetanus lasting over a week the temperature kept below 102° up to the time of death. It may have been that in these cases chemical change was converted into force, but over and above this a considerable elevation might have been expected from

muscular action, since in some experiments recorded Becquerel it was found that one degree of heat was produced each forcible contraction of a man's biceps.

The last thing to be noticed is the behaviour of the column of mercury itself, in different diseases and individuals ; how in some cases, it will rise very suddenly to a great elevation while in others it will attain to a similar height only after a prolonged period. Here, again, is a fact which admits of no complete explanation by any single agent, but which rather is the result of many conditions, among which, on the one hand, the before mentioned, the exposed or non-exposed condition of the surface of the body is obviously one.

Again, the rapidity of the blood current may be another factor. In cholera it is well known that together with very concentrated and almost stagnant blood is associated a remarkably depressed temperature, and the rise of the column of mercury is very slow. It does not, however, follow that in this disease the two conditions must stand to each other in the relation of cause and effect ; it may, indeed, be that some parent cause is producing both. Again, supposing the rapidity of the blood circulation to have some connection with the rate at which the mercury attains a fixed elevation, it might be thought that in children in whom the pulse is very quick some affirmative evidence would be shown, whereas (though I am not aware that this is corroborated by other writers on the subject) the maximum temperature seems in children to be reached more slowly than in adults. The explanation of this, however, is probably that in early life the skin has not yet attained perfect development, and that there is a less equal distribution of labour between it and the internal organs. A rapid pulse might then still indicate a quick circulation, but the skin temperature would not be a perfect index of the same by reason of functional inactivity.

In local inflammations, though there is apparently great heat of surface, the thermometer rises slowly, but more rapidly than when placed on a healthy part under similar external conditions.

Two experiments on this point are subjoined, the subjects of them being a boy, aged eight, with a suppurating gland one inch and a half below Poupart's ligament. In his case a s

fluctuating centre was surrounded by an extended bright red areola, gradually fading away into the healthy skin. Here were three parts of the surface with the rapidity of circulation differing in each—viz. a sluggish current through the suppurating part, a normal stream through the healthy skin, and an abnormally fast circulation through the areola. If, then, the view expressed before be correct, the rate at which the mercury would rise should vary as the state of circulation. It will be seen that the theory does not quite hold good, for though the temperature rose higher in a given time over the areola than over the spot at which suppuration had commenced, the latter in the same time gave a higher registration than the normal skin. The result obtained from the central part is, however, not free from fallacy, and is probably higher than it should be, inasmuch as the two parts of the abscess being contiguous, some of the heat expended on the mercury may have been derived from the excess of blood in the zone of redness, and not merely from the vessels over the abscess proper.

<i>Experiment I.</i> —On areola,	the thermometer rose to 97·5°F. in 45 seconds
central suppuration	„ 95·6°F. „
thigh (two inches below the	
abscess)	„ 94·5°F. „
<i>Experiment II.</i> —On areola	„ 95·7°F. „
centre	„ 93·6°F. „
In groin of opposite side	„ 97·4°F. „

In Experiment II the observations were made after the surface had been exposed for some minutes; this accounts for the standard obtained being lower than in Experiment I.

The condition of the skin, whether dry or moist, has some influence on the ascent of the mercury; in the latter state the rise is usually slow, while with a dry and pungent surface, as in pneumonia, it is sudden. An apparent contradiction to this statement is sometimes observed in patients during the last stage of typhoid and other diseases, in whom, while sweating profusely, the temperature may rapidly rise to a great height. This is explained by considering it to be a state analogous to that not uncommon in scarlatina, in which the skin is very dry, and yet the body covered with sudamina. This must surely be an exudation from dilated capillaries, and

no evidence of a true secretory function on the part of the glands.

I shall now first give a short summary of observations on temperature in disease, which have been made during the past twelve months; in the second place I shall see if it can be shown by such means that drugs have any influence over the progress of disease; thirdly, I shall notice any practical points that may have been observed, as aids to diagnosis, prognosis, or treatment.

Among *pyrexial disorders* there have been under observation:—of enterica 27 cases, of typhus 19, of scarlatina 5, of measles 8. Febricula is not included in this class, but will be noticed afterwards.

Enterica.—Of twenty-seven cases twenty-one recovered, and six died. In twenty-one of the same number the disease, estimated by the temperature, ran a long course, far beyond the limit generally stated; fourteen of these extended considerably over a month. Five cases, on the other hand, arrived at a favorable termination in less than the usual time, the elevation of temperature subsiding in from twelve to seventeen days. In all five the onset was much more definite than in enterica generally, and the duration of the attack could be pretty definitely settled.

A relapse occurred in four cases; in two the disease had apparently quite subsided, and the patients were to outward appearance well, when again they became seriously ill, and ran through a further course. In the remaining two the temperature had not yet reached the normal standard, when it rose again, and in both death resulted. Though it is now a well-established fact that a relapse does often occur in typhoid, so suggestive are these cases, and so contrary to all taught doctrines of specific poisons, that no apology is needed for introducing notes of two such here.

CASE 1.—“Matilda C—, æt. 18, admitted into Miriam, under Dr. Wilks, March 4th, 1869. Three weeks ago she was attacked with aching pains in all her limbs. Much headache and vomiting accompanied the pain. Gave up her work after a fortnight, and for the last week has had much

diarrhoea. Has also had a bad cough. The bowels are confined now. On admission she appears to be very ill, the abdomen is full and a few rose spots are visible."

The temperature was as follows :

Date.	Temperature.			
		Morning.		Evening.
March 4	.	102°	.	104·2°
" 5	.	103·2°	.	103°
" 6	.	101·6°	.	103·1°
" 7	.	97·1°	.	102·5°
" 8	.	99°	.	102·8°
" 9	.	102·3°	.	103·2°
" 10	.	100°	.	102·4°
" 11	.	99·1°	.	99·6°
" 12	.	98°	.	102·4°

Thus far, then, the disease was evidently near its termination, and so it proved, for the temperature remained steadily normal after the 16th day till the 28th, when it again became very high and continued so.

Date.	Temperature.			Pulse.
	Morning.		Evening.	
March 28	.	102·6°	.	103·6°
" 29	.	102·4°	.	102·3°
" 30	.	103·4°	.	102·8°
" 31	.	.	.	102·2°
April 1	.	102·3°	.	102°
" 2	.	102·3°	.	101·5°
" 3	.	102·3°	.	100·5°
" 4	.	100·6°	.	102·6°
" 5	.	101·3°	.	102·3°
" 6	.	101·2°	.	101·7°
" 7	.	100·2°	.	99·7°
" 8	.	99·6°	.	101°
" 9	.	98·2°	.	99·6°
" 10	.	96·7°	.	98·8°
" 11	.	103·5°	.	.
" 12	.	96·9°	.	96·3°

From this time she very slowly became convalescent, the temperature remaining rather below the normal point.

CASE 2.—Sarah F—æt. 24, a nurse, was admitted under Dr. Fagge on September 5th, 1869, with the following history.

She was quite well till twenty-five days ago. On August 11th, this being the second day of a catamenial period, she had much aching of the limbs and headache, and towards evening the menstrual flow ceased; she continued ill for four days but did part of her work. She then sought advice. The temperature was at that time 101° . Pulse 144. The evening temperature was 102° . She kept in bed for three days, and on the fourth the temperature was normal, and though weak she resumed her work. On August 28th she felt much worse again and took to bed on the 30th.

On September 3rd, the twenty-third day from the commencement of her attack, she had a moist skin with a moist furred and tremulous tongue. Temperature in the axilla 104° ; no eruption on the body; no enlargement of spleen; bowels loose, motions black. She continued in much the same state till the thirty-first day of illness, the temperature then fell and fluctuations commenced, continuing till the thirty-eighth day, after which time it went below normal.

It may be stated that in all the varieties of the class "fever" the temperature generally falls below normal after the attack and that unless it does this relapse is liable to occur.

Among 25 cases the range of temperature was highest during the 2nd week in 8; 3rd week in 12; 4th week in 3; 1st week in 2.

These figures show well the gradual onset of the attack since, in 20 out of 25, the fever was highest during the second and third weeks. In all but three cases the temperature was above 104° at the height of the disease.

In six fatal cases death occurred on the 9th, 14th, 21st, 26th (in two cases) and 50th days. In the patient who died on the 9th day a sudden rise from 103° to 107° ushered in death. A fatal prognosis, however, was made irrespective of this additional feature, and before it showed itself. At the post-mortem the affection of Peyer's glands was by no means extreme, and only slight enlargement of the mesenteric glands was observable. The stage of ulceration had commenced near the ilco-cæcal valve.

In the other patient who died during the height of the fever, viz., on the 14th day, the temperature did not rise at any time higher than 103° . This is interesting in connection

with the fact that, at the inspection, the agminated glands were diseased through the whole length of the small intestine, and for nearly two feet above the ileo-cæcal valve the mucous membrane was in a sloughing condition. Of the remaining four fatal cases it rose abruptly in two and fell in two. Of the latter, one died from peritonitis on the fiftieth day from the commencement. The fluctuations in this case were long continued (commencing on the 18th day and terminating a few days before death), and at times very extreme. An abstract from the chart is given to show these.

CASE 3.—Marianne T—, æt. 28, admitted to Mary, under Dr. Fagge, February 9th, 1869. Has been nursing her sister, who is ill with typhoid, for the last three weeks. Eight days ago felt weakness in the limbs, and headache. Has been purged to-day for the first time. Motions, loose and yellow. On admission one or two spots were seen on the abdomen, which was somewhat full. Temperature, 102·6°.

		Temperature.	
		Morning.	Evening.
On 26th day	. .	101° F.	104°
„ 27th „	. .	101·2°	103·8°
„ 28th „	. .	101·8°	105°
„ 29th „	. .	96·3°	104·8°
„ 30th „	. .	96·6°	104·8°
„ 31st „	. .	99°	101·2°

From this time the difference between the two observations was not excessive, being seldom more than 3½° F. The temperature did not again subside to normal, always being above 100° till death, on the 50th day. At the post-mortem there was no evidence of any recurrence of the attack, all the patches being in about the same condition and nearly cicatrised. Two of the glands, however, formed exceptions to this state, and had become gangrenous, a general peritonitis being set up.

Typhus.—Of nineteen cases thirteen recovered and six died. The duration of this disease is much more precisely defined than in enterica; but taking the eruption as generally appearing on the fourth day and dating from that, the period

has been rather shorter in these cases than that ordinarily noted. Among cases of recovery the fall in temperature occurred on the eighth day in four, on thirteenth day in three, and on the fifteenth in two.

In fifteen out of nineteen cases the range of temperature was highest during the first week in nine; during the second week in five. In eleven, the greatest elevation attained was between 104.5° and 105.5° . In the remaining four 103.5° was the highest point reached. Typhoid variations were noticed in three patients. In one of these, the eruption being well marked and characteristic, the temperature did not fall till the nineteenth day. In the other two the fall commenced on the twelfth and sixteenth days respectively.

In three cases the appearance of the eruption, during its earliest stage, so closely simulated the rose spots of typhoid that, but for its abundance, enterica would have been diagnosed.

In every case of recovery the temperature fell below normal after the subsidence of the fever.

Of the above cases only one is of sufficient interest to require special mention; it is that of a child.

Adelaide B—, æt. 5; admitted under Dr. Rees' care January 13th, 1869, with the following history. Two months ago her brother had fever. Fourteen days ago her grandmother died of typhus; her mother also has had fever lately. Patient's illness commenced four days ago. The eruption on her was first noticed this morning. On admission the child has whooping-cough, and her aspect is dull and heavy. Scattered over the skin, more abundantly on the face, forehead, and upper part of the trunk than elsewhere, is a punctate petechial eruption, and over the buttocks is a finely scattered, slightly raised macular rash, which is not distinctly petechial. The eyes look puffy and watery; whole face, especially upper lip, swollen; expectoration, viscid and glairy. No nasal discharge.

	Morn. Temp.	Even. Temp.
Jan. 13	—	103.2°
" 14	103.5°	102.3°
" 15	102°	102°
" 16	102°	103.3°
" 17	100.4°	102°
Jan. 18	98.1°	96.5°

Has a troublesome cough, with

much frothy expectoration. Sitting up in bed, and says she feels better. Appetite good. The eruption is fading. From this time the temperature kept below normal, and she got up.

It should be stated that, when the child was admitted, many expressed considerable doubt as to the real nature of the disease, the appearance of the patient being suggestive rather of measles than of any other affection, and the fact that convalescence commenced on the eighth day was also urged as contra-indicating typhus; but unless more convincing evidence than the unusually short course of the attack and the appearance of the child can be adduced in favour of measles, it must be held that the appearance of a petechial eruption on the fourth day, with a well-authenticated history of previous exposure to the poison of typhus, justified a diagnosis of that disease and of no other.

In five fatal cases death occurred on the 8th, 11th, 12th (2), and 14th days. In two only did the temperature rise before death, the rise being, in one case, $1\frac{1}{2}^{\circ}$, and in the second, 5° . In the most rapidly fatal case of all the thermometer registered no higher point than $101\cdot5^{\circ}$ throughout the disease. Fatal cases, therefore, are by no means necessarily attended with high temperature.

Diphtheria.—In the only case that has occurred the temperature was $104\cdot6^{\circ}$ the day before death. From that time there was a gradual fall to $102\cdot4^{\circ}$, the temperature noted half an hour before death.

George D—, æt. 19, admitted under Dr. Wilks into Stephen, June 2nd, 1869. Has had a sore throat for the last five days, and has been unable to swallow solids. On admission the tongue is thickly coated with yellowish fur, and there is much mucus about the fauces; but no evident membrane. Respiration is rather noisy; but the air enters chest freely.

3.30 p.m.—T. $104\cdot6^{\circ}$, P. 140, R. 23. 9 p.m.—T. $103\cdot8^{\circ}$, P. 118, R. 18.

June 3rd, morn.—T. $103\cdot8$, P. 118, R. 22. The urine contains a large quantity of albumen; but general condition is rather improved. He has slept badly. He was ordered Potassæ chloratis gr. x, Quinix sulph. gr. iij, ex Aquæ ℥j, every four hours, and to take wine, oz. vj. At 11 p.m. his temperature was $102\cdot4^{\circ}$, Pulse 110, R. 20. He seemed com-

fortable, and nothing was noticed during a visit occupying some minutes to show that he was in a dying condition. In a quarter of an hour the sister of the ward found him "very pale and taking deep inspirations," and he died before any assistance could be procured. The trachea was opened immediately, and artificial respiration resorted to, but no encouraging results were obtained. At the post-mortem, made by Dr. Moxon, the trachea contained a little puriform liquid covering the mucous membrane. The pharynx at its upper part, down to about the level of the uvula, was covered with thin pus, and the cleansed surface had the appearance of a layer of exuberant granulations. These had apparently extended from symmetrical fungating ulcers, one on each side, above the tonsils, with projecting and everted edges. The base of these was of a fibrous nature. The uvula and both tonsils were white and ulcerated; but no false membrane was found. The spleen was very soft; kidneys were healthy.

Scarlatina.—The sudden onset of this disease was noticed in all five cases that were under observation. Four of the five were apparently quite well till vomiting occurred, and this was followed in a few hours by the appearance of the eruption. The temperature on the second day has generally reached 102° to 103° . In three cases the course of the exanthem was protracted, the eruption remaining more than a week, and no decided fall in the temperature occurring till towards the end of the second week. Throughout the fever there was much enlargement of the glands of the neck in all, and this may have kept up the temperature beyond the usual time. Moreover, later on, two had albuminuria, and the other an attack of pleurisy. In one of the five cases the eruption was petechial, and the patient died on the fifth day.

William K—, æt. 8, admitted into John, under Dr. Fagge June 29th, 1869. He was quite well four days ago. Sudden vomiting then occurred, and the eruption appeared within twelve hours. On admission he is very restless and delirious. Tongue is dry, and covered with cracked sordes, as also are the teeth. The rash is very copious on the trunk; it is deep red, and petechial in character, the purpuric spots being very minute, and, as it were, peppering the surface. From a casual

glance the tonsils do not seem to be much affected ; but the disease is chiefly confined to the upper part of the pharynx.

	Temp. Morn.		Evening.		
June 29th	. 104.5°		Temperature 104.4°	P. 160.	R. 40
„ 30th	. 103.7°	P. 190. R. 32.	„ 102.4°	„ 120.	„ 40

Death occurred a short time after the last observation. In four of the five cases the pulse varied between 160 and 180 per minute during the first week, beating most quickly at the onset, and very gradually lessening in rate as the disease subsided.

Measles. — In this affection the temperature is said to rise to a great height; but in the cases mentioned here no extraordinary elevation was observed; indeed, I am inclined to doubt whether such does often occur. It is true that eight cases are not sufficient to enable one to form a positive opinion; but, in addition to those accurately noted during the whole course of the fever, many others have been seen casually as out-patients, and in none did the temperature rise above 103.5°, the average being 103°. In one of the eight it rose to 106°; but this was apparently more connected with the act of dying than with any special feature of the disease itself. In all the elevation of temperature was greatest at the onset of the attack, during the eruptive stage, and a fall to very nearly the normal range took place after two or three days.

One case occurring in a young adult, aged twenty, is recorded as an example. The course of the disease seemed to be in no way modified by the age of the patient.

Henry C—, æt. twenty, admitted into John, under Dr. Moxon, April 4th, 1869. Patient has had a bad cold and cough for a fortnight. Three days ago rigors occurred, and again yesterday; the second time accompanied by vomiting. Eruption began to appear last night. Has not had gonorrhœa lately; but has been taking medicine for his cough. One or two people are ill in the house with colds. No one has been affected with any eruption on the skin. On admission there is alight redness about the eyes, and the face is covered thickly with an eruption, consisting of livid red, raised, irregular-shaped blotches. On the chest and abdomen the rash is papular,

with small vesicles in one or two places; and this fact led to a diagnosis of variola on the part of some who saw the case.

Respiratory sounds, with the exception of slight crepitation towards the base of the left lung, are normal.

The progress of the eruption was, as usual, very rapid; the body being pretty uniformly red on the following day. The temperature fell on the fourth day, and again on the sixth.

Day of Disease.	Morn. Temp.	Evening.
4th . . .	—	104·2°
5th . . .	100·5°	102·6°
6th . . .	101·2°	99°
7th . . .	—	97·8°
8th . . .	99·3°	97·6°

Febricula.*—Under this head six cases are recorded; a short note is given of each.

CASE 1.—Minnie M'C—, æt. six, had been in a surgical ward since February 19th, for some slight disease about the ankle. This is now apparently well. She was transferred to Lydia, under Dr. Rees, March 14th, having been very feverish for two days. She has a tongue very suggestive of scarlatina; but there is no eruption on the body and no sore throat.

Date.	Day of Disease.	Temperature.		Pulse.
		Morn.	Even.	
March 13	2nd . . .	100·6°	102·4°	140
	3rd . . .	103·2°	102·8°	"
	4th . . .	102·3°	104°	"
	5th . . .	102°	102°	"
	6th . . .	99·6°	102·2°	"
	7th . . .	100·1°	101·5°	"
	9th . . .	98·6°	From this time it continued normal.	

No eruption occurred during the course of the disease. She had no pain in any of the joints, and no lung affection was detected. The pulse averaged 140 till the temperature subsided, when it also fell to 84 beats per minute.

* This term is used for the sake of convenience; but it must be allowed that it would be more scientific and more to the interests of medicine to let doubtful cases remain unnamed, and confess our ignorance of their causes, than to place side by side diseases which have only a superficial resemblance to each other, and in reality are alike in neither their origin nor their progress.

CASE 2.—Agnes P—, æt. 22. A servant, admitted into Lydia, under Dr. Moxon, January 3rd, 1869. She was seized with rigors fourteen days ago, and at the same time felt much pain in the head and back. She pursued her work the following day, and then took to her bed. She had frequent vomiting for a week, generally after her meals. On admission she is flushed, hot, and very thirsty; she also perspires freely. Urine healthy. Has had excessive menstruation for two years; but is not unwell now. There is no eruption on the body. Abdomen is normal. The spleen is just palpable.

Date.	Temperature.		Pulse.
	Morning.	Evening.	
Jan. 5th	99·5°	100·4°	100
„ 6th	99·3°	101·2°	120
„ 7th	98·8°	—	—
„ 8th	101°	—	—
„ 9th	98·1	—	—

She had considerable languor after the attack, and did not leave the hospital till February 5th.

CASE 3.—Daniel T—, æt. 15. Admitted to Stephen, under Dr. Habershon, May 24th, 1869. Is a blacksmith. He has had a cough for a week, with no expectoration. Since yesterday morning he has had weakness in his legs, and pains in the right side of his face. Has no diarrhœa. The tongue is dry and furred. Has had much earache since yesterday morning, with a dirty red discharge from his right ear. With the exception of a slight systolic bruit over the aorta nothing abnormal can be discovered. Even. temperature, 103·5°, p. 96, respiration 24. The next evening, the temperature was 99·6°, and it was normal again on the fourth day.

CASE 4.—Robert L—, æt. 19. Admitted under Dr. Wilks, on the fourth day of his illness. Has had a bad headache, with rigors. He now has much pain in the limbs; a temperature of 105°, pulse 120, respiration 35. The skin is dry, and there is slight muscular tremor. The temperature fell the next day to 103°, and to 96·5° on the sixth day of illness, accompanied by a profuse sweat. This case will be noted again, in reference to the action of quinine upon the temperature.

CASE 5.—James H—, æt. 23. Is a labourer, living at Deptford. Admitted into Stephen, under Dr. Habershon, May 19th, 1869. Has suffered from pains in his limbs, rigors, and headache for the last five days; he now feels very giddy. Has had no looseness of the bowels. Tongue is dry, white, and tremulous. There is no eruption on the body. Respiration normal; heart sounds normal.

Day of Disease	Temperature.		Pulse.
	Morning.	Evening.	
6th . . .	101·3°	103·6°	76
7th . . .	103·4°	104°	92 Much sweating
8th . . .	101·2°	102·8°	86
9th . . .	102·3°	102·6°	88
10th . . .	100·2°	99·5°	65
11th . . .	98°	97·7°	61 Still sweating profusely.

CASE 6.—Louis E—, æt. 16. Admitted under Dr. Habershon, for Elephantiasis Græcorum, on May 16th. On June 13th vomited freely several times; he also had diarrhœa, with a furred tongue. His throat was injected, and he had great difficulty in swallowing. No rash to be seen.

Day of Disease.	Temperature.		Pulse.
	Morning.	Evening.	
1st . . .	—	101·6°	130
2nd . . .	101°	102·4°	140
3rd . . .	100·6°	102°	140
4th . . .	101·4°	102°	128
5th . . .	99·5°	100°	112
6th . . .	98·4°	—	92

This patient had no eruption, and no apparent desquamation; but, nevertheless, he shortly after had an attack of acute albuminuria with pericarditis.

Of six cases of febricula, then, two, Nos. 1 and 6, were probably scarlatina. Nos. 2 and 5 would come more under the head of "simple continued fever," whatever that may mean. Case 4 was called famine fever, probably correctly, since it lasted five days, a profuse sweat accompanying the deferescence; but, no relapse having occurred, the accuracy of the diagnosis cannot be said to have been proved. No. 3

was apparently connected in some way with severe neuralgic pain in the head and face.

In *erysipelas* and *cynanche tonsillaris* the temperature is often high, and usually takes on the febrile type, with evening exacerbations; with this exception, the temperature in these diseases has not been noticed to have any special feature.

Syphilis.—The temperature was taken in two cases during the eruptive stage, and while the rash was still visible. In the first, the evening registration was only slightly higher than that of the morning; in the second, the rise at night was very decided. Unfortunately this patient was seen in private practice, and the temperature could only be obtained on three days.

CASE 1.—“Richard S—, æt. 23, admitted into Philip Ward, under Dr. Owen Rees, March 10th, 1869. Is a single man, by occupation a groom. Six weeks ago, two months after connection, he had much lassitude, with muscular pains, and a rash came out over the body.”

“On admission, he still has rheumatic pains all over him, and feels ill. The arms, legs, and face are covered with circular red stains, which, in some places, are covered with small shiny scales. Some of the patches are slightly indurated. There is enlargement of the glands in the groin and neck.”

Date.	Temperature.	
	Morning.	Evening.
March 10th . . .	—	99·6°
„ 11th . . .	98·0°	98·8°
„ 12th . . .	97·7°	98·8°
„ 14th . . .	98·2°	98·4°
„ 15th . . .	98·4°	98·0°
„ 18th . . .	98·0°	99·2°

CASE 2.—“Edward B—, æt. 26, was exposed to contagion six weeks ago. No excoriation or sore was noticed at the time, and his health has been quite good till within the last few days. A small sore has lately appeared on the glans, and seems to be extending. There is much enlargement of the glands in each groin, but no redness or appearance of commencing suppuration; a feeling of general malaise is expe-

rienced, but this is not aggravated at any particular time the day."

In about three weeks from this time, a well-marked copper roseola appeared all over the arms, shoulders, &c., attended with a great increase of languor, and the muscular pains were very severe. The patient also complained that every evening he became very hot and flushed.

The following temperatures were taken ten days after the first appearance of the eruption.

Date.	Temperature.	
	Morning.	Evening.
August 21st . . .	—	101·1°
„ 22nd . . .	99·0°	101·0°
„ 23rd . . .	98·8°	101·6°

Out of twelve other cases of syphilis and syphilitic eruption at longer date, no notable deviations from the normal range were found in any case, with one exception, which is here given.

CASE 3.—George M—, æt. 18, admitted under Dr. Habeshon, June 9th, 1869. Had gonorrhœa six months ago. He had a sore throat and muscular pains for four months; inflammation in the right eye for two months, and a pustular eruption on the arms and face for a fortnight.

Date.	Temperature.	
	Morning.	Evening.
June 10th . . .	—	100·2°
„ 11th . . .	99·2°	98·8°
„ 12th . . .	99·0°	100·0°
„ 13th . . .	99·2°	100·0°
„ 14th . . .	99·5°	99·4°
„ 15th . . .	98·6°	98·6°
„ 16th . . .	98·7°	99·2°

Ague.—The following cases, two quotidian and three tertian, are noted more for the interest which ague possesses when contrasted with other diseases than from their presenting peculiarities of their own.

CASE 1.—Quotidian. Hannah McL—, æt. 16, admitted under Dr. Pavy April 15th, 1869.

Has had ague for two months, since a visit to the island

Sheppey. The fits occur daily between 11 a.m., and 12 noon. Splenic dulness begins over the seventh rib and extends one and a half inches below the free margin of the ribs.

17th. Shivered to-day for the first time since admission. The rigor began quite suddenly while she was under examination.

Temperature.	Pulse.	Respiration.
101·6°	152	28 at onset (11 a.m.).
104·0°	—	— thirty minutes after.
98·2°	100	36 at 9 p.m. Is sweating.
19th 104·6°	164	40. Has a fit every day. Spleen comes nearly to the umbilicus.

She was treated at first by arsenic, and this failing, by quinine.

CASE 2.—Quotidian. William S—, æt. 49, admitted April 12th, 1869, under Dr. Moxon. He gives a history of injury to his back eight days ago. He is very hot and the tongue is dry and furred. Temperature 105° at 4 p.m.

8·30 p.m. Temperature 101·5°; pulse 110; respiration 36. He is sweating profusely.

Rigors occurred daily, the temperature generally being about 103° one hour after their cessation.

Arsenic was given at first, the only visible difference in the attacks after this remedy being that they were postponed till later in the day; occurring at 4 or 5 p.m., instead of from 9 to 11 a.m. He was cured by quinine.

CASE 3.—Tertian. Hannah S—, æt. 37, admitted under Dr. Wilks, May 11th, 1869. Is married and has a family. Has had tertian ague for seven weeks. The rigors usually last an hour, and she is in a fever the whole day. No splenic enlargement.

May 12. Rigor began at 12.30 and lasted till 2.30 p.m. At 3 p.m., Temperature 104·6°; pulse 140.

14th. At 11.30 a.m (about the usual time for the fit) she had one and a half grains of quinine injected over biceps humeri. The rigors began soon after and were not shortened by the medicine.

15th. Rigors commenced at 9 a.m., lasting two hours. 12 noon, temperature 104·4°.

16th. 11 a.m., rigors commenced after a cold sensation for a quarter of an hour. Temperature $102\cdot7^{\circ}$; pulse 152. A dose of three grains of quinine was now injected.

17th. Rigors set in again to-day. Temperature $103\cdot6^{\circ}$ three hours after their cessation.

18th. 7.30 a.m. Quinix Sulph. gr. x given by the mouth. Rigors came on at 10 a.m. She says "the shivering was nothing near so bad as yesterday." Temperature $104\cdot2^{\circ}$, pulse 124, two hours after cessation of rigors. She had no further fits.

CASE 4.—Tertian. C. C—, æt. 42, admitted under Dr. Wilks, May 28th, 1869. Is a labourer, living at the London Docks. Was quite well a fortnight ago, but for the last few days has had pains about him, and shivering every other day. He has never had ague.

On admission he is sweating much. Temperature 98° . Has much pain in the head and back. No affection of the heart or lungs.

Date.	Hour.	Temperature.	Pulse.	Respiration.	
29th	—	$96\cdot6^{\circ}$	64	14	
30th	—	—	—	—	Had a rigor at 8 a.m. lasting for 45 min.
„	10.30 a.m.	$104\cdot2^{\circ}$	124	28	
„	10 p.m.	$97\cdot4^{\circ}$	92	16	Has been in a profuse perspiration all the afternoon.
31st	—morning	$99\cdot5^{\circ}$	69	18	
„	—evening	$98\cdot0^{\circ}$	80	16	
June 1st	—morning	$100\cdot7^{\circ}$	100	28	Is sweating profuse. Has not shivered this morning, but slept continuously since last night.
„	—evening	$97\cdot4^{\circ}$	60	16	

He had no further attack from this time.

This case is worthy of remark, because the patient got well without medicine; and on June 1st he apparently slept through both the cold and hot stage, and woke up sweating.

CASE 5.—Tertian. E.W—, æt. 13, admitted under Dr. Fagge, June 2nd, 1869. Her brother is in the hospital for the same disease. She has had ague for three weeks; the rigors gene-

rally come on in the morning. I am indebted to Mr. Mallam, the clinical clerk, for many of the temperatures given in this case.

Date.	Hour.	Temperature.	Pulse.	Respiration.	
June 2nd .	4.30 p.m. .	97·8° .	72 .		
„ 3rd .	9.30 a.m. .	105·5° .	118 .	44	{ Rigors began at 7.30, and lasted 1 hour. Is now going through the hot stage.
„ „ .	11.30 a.m. .	103·0° .			
„ „ .	12 noon .	103·0° .			
„ „ .	10 p.m. .	97·0° .	70 .	32	
„ 4th .	. .	97·5° .	58 .	19	
„ 5th .	. .	103·2° .	120 .	32.	Hot stage.
„ 6th .	. .	97·5° .	64 .	16	
„ 8th .	1.40 p.m. .	102·4° .	116 .	28	{ Has had rigors for 20 minutes.
„ 9th .	9.15 a.m. .	101·2° .	98 .	22	{ At very commencement of the cold stage.
„ „ .	11.15 a.m. .	104·0° .	110 .	34.	Hot stage.
„ „ .	1.15 a.m. .	101·0° .	104 .	24	
„ „ .	10.30 p.m. .	95·6° .	78 .	22	
„ 10th .	1.0 p.m. .	104·6° .	100 .	32	{ One hour after rigors.
„ 11th .	9.20 a.m. .	. .	. .	. .	{ Rigor now commencing. Quinine gr. x given.
„ „ .	10.5 a.m. .	100·5° .	. .	. .	Still shivering.
„ „ .	10.30 a.m. .	103·0° .	. .	. .	{ Rigor has just ceased.
„ „ .	11.10 a.m. .	104·0° .			
„ „ .	12.0 noon .	105·0° .			
„ „ .	1.0 p.m. .	104·5° .			
„ 22nd.	Has had no return of the fits.				

Relapsing Fever. The diagram which faces the following page shows well the abrupt rise and fall in temperature in this disease.

The form of “Hospital chart” which is now used at Guy’s, and of which the diagram just referred to is a specimen, was drawn out by Mr. Reginald Stocker, while house physician, with the view of showing as precisely as possible what relation the temperature, pulse and respiration bear to each other in different forms of disease. By printing them thus on a chart, it is not, however, meant to imply that, for instance, a temperature of 100° corresponds strictly to a pulse of 100 per minute or to respirations at the rate of 25 in a

minute. Probably it would be impossible to fix an absolute standard of this kind; but on a comparison of cases this seems to be correct enough to form a starting point from which to obtain further data.

The notes of the case and the temperatures were furnished by Mr. Taylor.

William T—, æt. 14. Admitted under Dr. Rees, November 15th, 1869. Has been three weeks out of work. On November 13th was suddenly taken with shivering and giddiness.

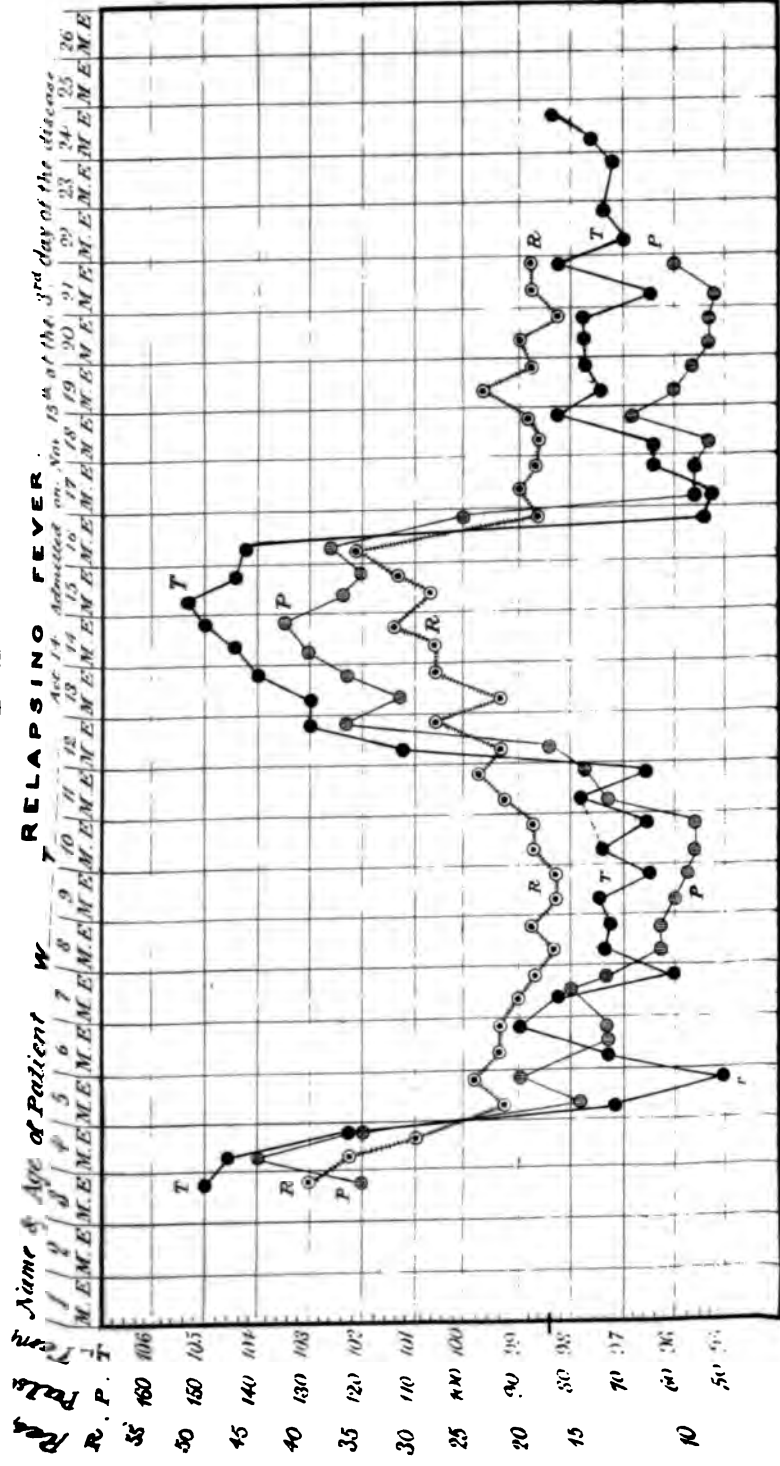
It will be seen that he was admitted on the third day of his illness. The diagram sufficiently indicates the course taken by the disease in this case.

Erythema Nodosum.—Attention has lately been called to this disease, by Mr. Hutchinson, in a clinical lecture¹ delivered by him. In this lecture he insists on the points of resemblance between it and the exanthemata.

With a view to adding some information on this point, the temperature has been observed in nine cases, since it was thought, that were this disease an exanthem, it ought to follow a definite course, and that this would be shown by the temperature. Such, however, is not the case; for, apart from a slight continued elevation, during the stage of eruption, and a slight increase of fever when fresh outbreaks occurred, there was nothing in the temperature to distinguish erythema nodosum from any other disease, or to lend any countenance to the idea that it is "a skin eruption, attended by a specific fever," this being Mr. Hutchinson's definition of an exanthem.

CASE 1.—Martha P—, æt. 8, admitted into Mary Ward, under Dr. Wilks, May 15th, 1869. There is no history of rheumatism or gout in the family. The child has had measles, but no other complaint; she has been ailing for a week, and for nearly the same time has had an eruption on her legs. When admitted she had much pallor of countenance, and looked extremely ill; the legs and arms were covered with patches, having the usual appearance of erythema nodosum.

¹ 'Medical Times and Gazette,' vol. i, 1869, p. 352.





	Temperature.		Pulse.	
	Morning.	Evening.		
May 15th .	99·6° .	100·6° .	120	
„ 16th .	100·5° .	101·6° .	128	
„ 17th .	99·3° .	99·5° .	100	
„ 18th .	100·4° .	100·0° .	120.	Erythema nearly gone.
„ 19th .	99·7° .	99·7° .	108	
„ 20th .	101·2° .	99·6° .	100	
„ 22nd .	100·6° .	99·6° .	98	
„ 23rd .	101·4° .	100·0° .	112	
„ 24th .	101·5° .	98·6° .	140	
„ 25th .	102·3° .	101·0° .	120	
„ 26th .	102·3° .	102·5° .	118.	Some fresh erythematous lumps have appeared on the legs and arms.
„ 27th .	102·6° .	100·0° .	114.	Many fresh patches
„ 28th .	100·6° .	.	124	
„ 29th .	99·8° .	99·2° .	100	
„ 30th .	98·0° .	98·0° .	80.	Spots nearly gone.

CASE 2.—Jemima W—, æt. 7, admitted into the Evelina Hospital, under Dr. Fagge, July 1st, 1869. Her mother has had rheumatism. The patient has never had rheumatism or scarlatina. Three months ago she attended as an out-patient at Guy's, with red tender swellings on the shins; she soon got well and remained so till four days ago, when the same kind of spots again made their appearance.

On admission the erythematous patches occupy the fronts of both legs over the surfaces of tibiæ; they extend from the ankle to the knee. There is no enlargement of the spleen.

Day of Disease.	Temperature.		Pulse.	
	Morning.	Evening.		
5th .	99·5° .	100·4° .	.	
6th .	99·6° .	99·5° .	100	
7th .	97·4° .	98·0° .	86.	Eruption fading.
8th .	98·8° .	98·8° .	.	
9th .	Went out well.			

CASE 3.—Joseph B—, æt. 68, admitted to Guy's in March, 1869. Has never had gout or rheumatism; there is no history of any family taint of this kind.

Date.	Temperature.		Pulse.
	Morning.	Evening.	
August 11th .	99·8° .	100·2° .	98
„ 12th .	99·6° .	98·4° .	. Spots are fading.
„ 13th .	98·6° .	97·6° .	.

In this case convalescence was lingering.

CASE 6.—Emma C—, æt. 20, admitted under Dr. Pavy July 2nd, 1869. Is a domestic servant; has felt very weak for the last few days. Four days ago an eruption appeared on the legs.

On admission the lumps cover the shins and arms; there is also some erythema on the face. Urine 1010 with a trace of albumen.

Day of Disease.	Temperature.		Pulse.
	Morning.	Evening.	
4th .	101·2° .	100·6° .	96
5th .	101·2° .	101·2° .	100. Several fresh spots.
6th .	100·0° .	101·2° .	80
7th .	100·4° .	100·4° .	. Fresh spots continue to appear.
8th .	99·0° .	100·4° .	
9th .	99·4° .	100·0° .	. Fresh spots.
10th .	98·8° .	99·6° .	
11th .	98·0° .	98·0° .	. Is perspiring profusely.

During the next few days the temperature remained about normal, and no fresh spots appeared. Eleven days afterwards traces of the eruption were still apparent.

I am indebted to Dr. Hilliard, late house physician at Guy's, for the notes of this case.

CASE 7.—Mary S—, æt. 9, admitted into the Evelina Hospital, under Dr. Hilton Fagge, September 9th, 1869. There is no family history of rheumatism or gout. The eruption came out on the legs fourteen days ago, and she had been ill for a week previously. Several fresh spots have appeared since the first outbreak.

On admission the lumps are more numerous over the calf of the leg, the surface of tibia being avoided. No appearance of the disease on other parts of the body. The tongue is

furred and there is some pallor of face. No enlargement of spleen.

Date.	Temperature.		Pulse.
	Morning.	Evening.	
Sept. 9th .	100·4° .	99·4° .	124
„ 10th .	98·6° .	99·0° .	108. Eruption is fading
„ 11th .	98·0° .	98·4° .	88
„ 12th .	. .	. .	The eruption is nearly gone.

CASE 8.—Rachael W—, æt. 7, admitted into the Evelin Hospital under Dr. Fagge, October 18th, 1869. There is family history of rheumatism on both sides. The patient has never had rheumatism, neither has she had anything of the kind before. She has had scarlatina, measles, chicken-pox, smallpox, and whooping-cough. The eruption appeared on the fourth day of her illness on the legs, and fresh spots have daily appeared.

At the present time, four days after the first appearance of the eruption, the legs between knee and ankle are nearly covered with red blotches which are intensely painful. There is no fever in the neighbourhood of her home.

Day of Disease.	Temperature.		Pulse.
	Morning.	Evening.	
8th .	100·6° .	101·0° .	124
9th .	101·0° .	100·5° .	152
10th .	100·6° .	100·2° .	124
11th .	99·6° .	99·6° .	112

She went out well on the fourteenth day. A slight staining was still visible on the legs.

CASE 9.—Occurred in an out-patient, G. C—, æt. 6½. The temperature could not be daily recorded, as he was only seen at intervals. During the progress of the affection three observations were made, a period of two days occurring between each, and a temperature of 98·6° was the highest point reached. I have only further to remark with regard to this case that the eruption occupied a more extended area than in any of the other patients, the legs, buttocks, and arms being absolutely covered, while at the same time the boy appeared to be in his usual health.

Of these nine cases then, six occurred in females, three in males,—six in children, three in adults. In seven patients the disease was attended by elevation of temperature, but the fever was not found to be proportionate to the amount of the eruption. The disease was symmetrical in all the patients; it mostly occurred in stages or crops, and in one case a distinct history was given of a recurrence of the disease within three months of the first attack; the eruption attacked the legs in *all*; from these it sometimes extended to the buttocks and arms, but in only one case was any affection of the face noticed.

Lastly, all were treated in the general wards of a hospital, and in no case did it spread to a second patient. I think it may also be assumed that, as no two members of a family were under treatment at any one time, no simultaneous outbreaks of the disease occurred.

Acute Rheumatism.—From notes of twenty-five cases I find that the average maximum temperature was 102° ; that in twelve uncomplicated cases, the average maximum temperature was 101.2° , and that in thirteen cases with cardiac complications the average maximum temperature was 102.7° .

Classifying these under the head of treatment—

Alkalies were given in 9 cases with an average maximum temperature of	101.2°
Lemon juice was given in 7	102.5°
Various remedies { Calomel and } were given in 9 cases with { Opium, Aco- } an average maximum { nite, &c. } temperature of .	103.0°

It is worthy of note, in reference to these cases, that of the thirteen complicated with cardiac disease, twelve had some indication of heart affection when admitted, and in only one did it apparently commence during residence in the hospital.

The value of the thermometer in acute rheumatism is, however, more plainly manifest as an aid to prognosis. Thus, five patients had delirium during the progress of the case. Three of these recovered with a temperature never rising above 102° , while two died with temperatures of 105° and 109° . This bears out the statement of some authors that a temperature of 105° and upwards in this disease is always fatal.

Of one of these fatal cases I will give a more detailed account.

Eliza B—, æt. 17, admitted February 8th, 1869, under Dr. Wilks. Her mother has had rheumatic fever. Patient has had no previous attack. She has been ill for some days, and took to her bed eight days ago.

On admission the patient is a girl of good features, with dark eyes and hair, and long eyelashes. The wrists and knees are principally affected. She is slightly delirious at times.

There is a loud pericardial friction sound over the whole of the heart's area.

Date.	Temperature.		Pulse.
	Morning.	Evening.	
February 8th .	106·0° .	105·0° .	142
„ 9th .	103·2° .	104·6° .	130
„ 10th .	105·1° .	— .	136

After being very delirious all night, she died at 10·30 a.m.

Tubercular Meningitis.—Six cases have been under observation. In all the temperature kept below 102°, and in two of the number it kept below normal for some time, but rose gradually before death.

The ages of the respective patients were 26, 33, 6, 7, and 5 years, and 18 months. In the youngest child death took place nine weeks from the commencement of the disease, and in the patient æt. 33 years, at five weeks from the onset; in the remaining four it occurred within three weeks. In only one did any decided evening exacerbation of the temperature show itself.

Tuberculosis.—In three out of four cases an evening rise in temperature was noticed, producing variations similar to those so often seen at the termination of enterica and also during the course of an empyema. It is not a little singular that, while pneumonia, a disease essentially of cell growth, should, as it were, studiously avoid the exanthem type of temperature, tubercle, also a disease of cell formation, should possess this feature in a marked degree. This fact adds one more to the already existing similarities between tuberculosis and enterica.

Of acute inflammatory diseases, pneumonia seems, as far as I have observed, to be the only one which causes any great rise of temperature, and this only for a short time, the fever usually subsiding in three or four days, thus :

CASE 1.—George B—, æt. 25, was admitted into John Ward under Dr. Hilton Fagge, May 27, 1869, with acute pneumonia of the apex of the right lung. He is a compositor. Has felt ill for four days.

On admission. Percussion note is dull down to the third rib in front on the right side, and as far as the angle of the scapula behind. There is bronchial breathing with bronchophony over these parts, and a very little fine crepitation.

Sputum characteristic. Slight delirium at night.

Day of Disease.	Temperature.		Pulse.	Respiration.
	Morning.	Evening.		
5th . . .	103·3°	102·8°	112	42
6th . . .	104·0°	101·0°	112	40
7th . . .	102·8°	102·6°	119	40
8th . . .	102·0°	—	98	36
9th . . .	97·4°	—	66	26

In eight out of ten cases of acute pneumonia and pleuro-pneumonia, the temperature was above 104° at the commencement of the attack. In the remaining two crepitation had set in some days before any observation was made. One of these cases requires some notice, however, because the temperature remained rather below normal all along, and at the post-mortem, three weeks after the onset of the illness, large portions of the lower lobes were still in a state of hepatization, thus proving that cell-formation of itself does not account for, or necessarily cause elevation of temperature.

CASE 2.—William S—, æt. 35, admitted under Dr. Wilks, January 8th, 1869. Is a gardener and has had ill health for a long time. He had slight hæmoptysis two years ago and his breath has been very short since. He got wet eight days ago and had rigors afterwards. Four days ago, he again spat up some blood.

On admission there was evidence of consolidation towards both bases. The temperature was 99·5°.

January 9th.—Temperature 98°.

17th.—Bronchial breathing still continues with much crepitation at the bases. Temperature 97° ; he died on the 19th.

The following is an extract from Dr. Moxon's report of the post-mortem.

"*Lungs.* The right was the less diseased of the two, but in both the conditions were the same. At the bases the lobular septa were much hypertrophied, the lobules wasted and the whole substance shrunken and hardened. This condition was centred at the middle of the lower lobes, but it extended about in all directions and the upper lobes were not entirely free. The other parts of the lungs were markedly emphysematous. In addition to these changes of old date, large parts of the lower lobes were hepatised, though the section was more pellucid and œdematous than usual; abrupt islets of healthy lung-tissue also occurred at spots.

"The right side of the heart was much hypertrophied."

Pleurisy.—In three uncomplicated cases the temperature never rose above 100° . Indeed it is doubtful whether pleurisy of itself does cause much abnormal rise. My reasons for this opinion are, 1st, that in pleuritic effusion the temperature is often below rather than above normal, and, 2ndly, that post-mortems are constantly revealing extensive adhesions, where no history of former illness exists. Such would not be the case did a high temperature accompany this disease.

That simple inflammation of a serous membrane causes little elevation of temperature is corroborated somewhat by the fact stated above, that there is no great difference in favour of uncomplicated over complicated cases of acute rheumatism, unless the latter be attended with myocarditis and delirium.

Again, of eight cases of peritonitis, one terminated fatally after five days of high fever, ranging from 102° to 104° , but in this patient extensive suppuration had taken place in the abdominal cavity, and explained the great pyrexia. Another patient had a temperature of 104° for some time, but here the peritonitis was complicated with pneumonia. In the remaining six, though the symptoms were severe, the temperature was never above 100° , and at times was below normal.

Of the temperature in *acute hepatitis* I know nothing. In a case of *acute yellow atrophy* of the liver, admitted to Guy's in 1867, the temperature was 97.2° the day before death. In a second case admitted in June, 1869, there was a slight alteration of temperature.

I am indebted to Mr. Frederick Taylor, House-surgeon at that time, for the notes of this case.

William P—, æt. 18, admitted under Mr. Birkett, June 27th, 1869, for venereal sores. He has had sores on the prepuce for a month. He has now a tubercular eruption on the back, &c. He has been jaundiced for three weeks, but the yellowness became more marked on Wednesday last, four days ago. He was very drowsy all that day, only just recognising his friends.

On admission the skin is intensely yellow. No purpuric spots are visible. The liver is not to be felt below the ribs, indeed, the hand can be put quite under the edge of the thorax. Dulness extends upwards no higher than the seventh rib. Is very drowsy. Urine stains linen a bright yellow.

June 28th.—More comatose. Temperature 99.4° ; pulse 130.

10 p.m.—Temperature 101° ; pulse 148; respiration 32. He died five hours after.

In *acute Bright's disease* the temperature usually ranges between 98° and 100° , but it should be known that sudden elevations of 4° or 5° at times occur, the fall being as sudden as the ascent. I have been unable to associate these with any pneumonia or pleuritis; indeed, the rapidity of the rise, and the as sudden return to the normal point, all being accomplished within a few hours, would negative any such idea.

In a case of *leucocythæmia* observed by Mr. Taylor, house-physician at Guy's, the temperature varied between 99° and 101° , and on referring to the table it will be seen that a definite evening elevation generally occurred.

Should this turn out to be often the case, it would be interesting, as tending to show that there are reasons other than purely anatomical ones for grouping together the "lymphomas" (leucæmia, tubercle, &c.) of Virchow.

CASE.—*Leucocythæmia* ; enlarged spleen and liver.

Daniel M—, æt. 30, enjoyed good health till eight months ago, when the abdomen began to swell.

Date.	Temperature.		Pulse.
	Morning.	Evening.	
October 18th .	—	100.2°	108
„ 19th .	99.8°	100.2°	100
„ 20th .	99.8°	101.0°	106
„ 21st .	—	100.2°	110
„ 22nd .	99.2°	100.4°	106
„ 23rd .	99.4°	—	112
„ 25th .	100.0°	—	108
„ 26th .	100.0°	—	116

In a second case, that of a child aged eighteen months, coming under my own observation, though the temperature at times rose above 100°, there was no decided regularity in its rise and fall.

Lastly, as far as observation has gone, “smaller ills,” such as dyspeptic headaches, summer diarrhœa, catarrh, &c., appear to have but little disturbing influence on the temperature. In a catarrhal attack, which was accurately noted by Mr. Taylor, the temperature had risen .4° eight hours after the commencement. The next morning there was a further rise to 98.9°; the average normal temperature of the patient being 98°. It fell again towards evening.

I now pass to the influence of treatment over the progress of disease. Short notes are given of the temperature ranges of patients to whom large quantities of wine and quinine have been administered, these being the only two drugs which have been prescribed in any series of cases sufficiently extended to allow of a conclusion as to their antipyretic action being arrived at.

Quinine has been given in eighteen cases, viz., in typhus twice, in enterica nine times; also in measles, scarlatina, acute rheumatism, and tetanus.

CASE 1.—Typhus. Richard W—, æt. 25, admitted March 3rd, 1869, under Dr. Owen Rees. He has been ill a week.

On admission the eruption is spread thickly over the abdomen and arms. The face is characteristic.

Date.		Temperature.	Pulse.	
March 3rd	{ Morn.	—	—	
	{ Even.	103·0°	136	
" 4th	{ Morn.	103·0°	—	Quinine gr. xx administered,
	{ Even.	101·0°	—	but it was vomited soon after.
				Dose repeated at 1.30 p.m.
" 5th	{ Morn.	102·2°	—	Quinine repeated to-day with
	{ Even.	102·5°	—	no effect.

Case 2.—Typhus. Anne M—, æt. 36, admitted under Dr. February 14th, 1869.

Date.		Temperature.	
Feb. 13th	Morn.	103·0°	
" "	Even.	103·0°	
14th	Morn.	103·5°	Quinine gr. xx administered at noon.
			Had very severe headache after it.
			No fall in temperature occurred;
			there was, however, no evening rise.
" "	Even.	103·3°	
" 16th	Morn.	102·8°	Quinine repeated to-day with no effect.
" "	Even.	103·4°	

The temperature began to fall on the ninth day, and was normal on the fourteenth.

Case 3.—Enterica. William S—, æt. 21, admitted August 1869, under Dr. Wilks.

		Temperature.	
18th day	Morn.	104·0°	Quinine gr. iij every four hours.
19th "	Even.	103·0°	
20th "	Morn.	101·7°	

The temperature rose again after this, and death took place on the twenty-sixth day from peritonitis.

Case 4.—Enterica. Joseph N—, æt. 24, admitted under Dr. Ashon, February 22nd, 1869.

		Temperature.	
8th day	Morn.	100·5°	
" "	Even.	103·2°	
9th "	Morn.	103·3°	Quinine gr. xx administered.
" "	Even.	101·1°	
10th "	Morn.	103·1°	Quinine was repeated.
" "	Even.	99·8°	Had very slight headache after medicine.
11th "	Morn.	101·6°	
" "	Even.	103·5°	

			Temperature.	
12th day	.	Morn.	.	103·8°
" "	.	Even.	.	104·0°
13th "	.	Morn.	.	104·0° Quinine repeated.
" "	.	Even.	.	102·5°
14th "	.	Morn.	.	103·3° } Quinine repeated. Te
" "	.	Even.	.	100·6° } was normal on 24th da

CASE 5.—Enterica. No effect. Mary M—, æt. 13, s under Dr. Fagge, June 25th, 1869. Has been ill twen and in bed for ten.

The temperature became normal on the 27th day.

			Temperature.	
June 25th	.	Morn.	.	—
" "	.	Even.	.	103·6°
" 26th	.	Morn.	.	101·3° Quinine, gr. x, give
" "	.	Even.	.	102·0°
" 27th	.	Morn.	.	101·0°
" "	.	Even.	.	103·6°
July 10th	.	Morn.	.	99·0°
" "	.	Even.	.	102·3°
" 12th	.	Morn.	.	98·8° Quinine, gr. x, giv
" "	.	Even.	.	101·0°

CASE 6.—Enterica. Henry B—, æt. 24, admitted u Wilks, June 1st, 1869. He has been ill fifteen days.

			Temperature.	
June 3rd	.	Morn.	.	102·4° Quinine, gr. x, given
"	.	7 p.m.	.	102·6°
"	.	10 p.m.	.	101·7°

CASE 7.—Enterica. James R—, æt. 14, admitted u Wilks, June 21st, 1869. Has been ill fourteen days.

			Temperature.	
15th day	.	Morn.	.	—
" "	.	Even.	.	104·0°
16th "	.	Morn.	.	105·0°
" "	.	Even.	.	104·0°
17th "	.	Morn.	.	101·6° Quinine, gr. x, given
" "	.	Even.	.	103·0°
18th "	.	9 a.m.	.	101·2° 9.15 a.m. quinine, gr
" "	.	11 a.m.	.	100·8°
" "	.	2 p.m.	.	101·5° 2.15 p.m. quinine rep
" "	.	4.30 p.m.	.	101·8°
" "	.	7 p.m.	.	101·6°
19th "	.	Even.	.	102·4°

The temperature became normal on the 22nd day.

CASE 8.—Enterica. William H—, æt. 18, admitted u Wilks, on July 16th, 1869.

			Temperature.	
11th day	.	Morn.	.	101·6°
" "	.	Even.	.	102·8°
12th "	.	Morn.	.	102·0°
" "	.	Even.	.	102·0°
13th "	.	Morn.	.	101·6°
" "	.	Even.	.	101·6°
14th "	.	Morn.	.	101·0°
" "	.	Even.	.	102·4°

Quinine, gr. x, given.

Quinine repeated.

CASE 9.—Enterica. No effect. Death. Louisa M—, æt. 18, admitted under Dr. Habershon, March 31st, 1869.

			Temperature.	
6th day	.	Morn.	.	—
" "	.	Even.	.	103·0°
7th "	.	Morn.	.	103·4°
" "	.	Even.	.	103·7°
8th "	.	Morn.	.	103·2°
" "	.	Even.	.	106·4°
9th "	.	Morn.	.	107·2° at death.

Quinine, gr. iij, to be taken every 4 hours.

CASE 10.—Enterica. John V—, æt. 16, admitted under Dr. Wilks, March 1st, 1869.

			Temperature.	
10th day	.	Morn.	.	—
" "	.	Even.	.	103·2°
11th "	.	10 a.m.	.	102·0°
" "	.	5 p.m.	.	101·4°
" "	.	10 p.m.	.	100·6°
12th "	.	Morn.	.	102·6°

Quinine, gr. xx, given.

Death occurred on 13th day.

CASE 11.—Enterica. Eliza K—, 27, admitted under Dr. Rees, June 14th, 1869.

15th day. Quinine was ordered in two-grain doses every four hours. After this date it was noticed that the evening temperatures were nearly always lower than those of the morning.

CASE 12.—Febricula. No effect. Robert L—, admitted under Dr. Wilks, June 4th, 1869. He was quite well four days ago.

			Temperature.	
4th "	.	Morn.	.	102·0°
" "	.	Even.	.	104·8°
5th "	.	Morn.	.	103·8°
" "	.	Even.	.	103·0°
6th "	.	Morn.	.	98·2°
" "	.	Even.	.	96·5°

Quinine, gr. x, given at 6 p.m.
9 p.m.

CASE 13.—Measles, pneumonia. Sarah M—, æt. 18 months, out-patient at the Evelina Hospital.

			Temperature.	
5th day	.	Morn.	.	—
" "	.	Even.	.	105·0°
6th "	.	Even.	.	104·3°

Hot bath given for 20 minutes.
No change produced in temperature of the body (surface).

			Temperature.
7th day	.	2 p.m.	103.5°
" "	.	8 p.m.	102.4°
8th "	.	8 p.m.	106.0°

Quinine, gr. iij, given
Death occurred on

CASE 14.—Measles. George B—, æt. 2½, admitted Evelina Hospital, under Dr. Hilton Fagge, July 30th.

			Temperature.
			Morning.
			Evening.
3rd day	.		101.0°
4th "	.		101.6°
5th "	.		100.4°
6th "	.		103.6°
7th "	.		103.0°
8th "	.		103.8°

Quinine, gr. iij, given
Evening observation
7 p.m.

From this time the temperature fell gradually to normal.

CASE 15.—Scarlatina. Mary H—, æt. 6, admitted Evelina Hospital, under Dr. Fagge.

			Temperature.
5th day	.	Morn.	105.0°
" "	.	Even.	103.2°
10th "	.	Morn.	103.0°
" "	.	Even.	104.0°

Quinine, gr. i
Quinine repeated

CASE 16.—Acute rheumatism. No effect. Eliza B—, February 8th, 1869, under Dr. Wilks.

			Temperature.
Feb. 9th	.	Even.	104.5°
" 10th	.	10 a.m.	105.1°

Quinine, gr. iij, every
Has had 12 grains of
divided doses.

CASE 17.—Tetanus. No effect. Frederick K—, admitted under Dr. Owen Rees. He was ordered quinine every six hours. The temperature rose from 101.0° between 4 p.m. and 2 a.m., at which hour death occurred.

CASE 18.—Tetanus. No effect. Charles P—, æt. 23, under Dr. Habershon, January 10th, 1869.

Temperature, 9 p.m., 100.4°. Quinine gr. x every three hours.
January 11th.—12 noon, 105.2°. Has had fifty grains of quinine. Death occurred soon after the last observation.

On making an analysis of these cases, it will be found that in eleven there was an arrest of the rise of temperature when the drug was given. In some of them there was a decided fall, in others it was noticed that the evening exacerbation was lessened. In others, again, the reduction of temperature is only

then compared with the registration of previous days. In two cases (11 and 12), the course of the fever *changed* after the drug had been administered, in one becoming inverted, so to speak the morning temperature being usually higher than that of the evening, and in the other subsiding altogether. It is, however, doubtful whether, in the latter case, the drug had anything to do with the fall, seeing that a gradual rise continued to take place for some hours after the quinine had been given. In two cases of tetanus, one of typhus, one of typhoid, and one of acute rheumatism, the drug apparently exerted no influence; but it could be said that in the patient with typhus,—a nurse in the hospital, who might have been expected to do badly,—the disease ran a short course, the temperature falling on the ninth day, and becoming normal on the fourteenth. In this case,—the only one in which any unpleasant symptoms were noticed,—there was severe headache after the administration of the drug. These results then, on the whole, accord with those of previous observers, and seem to show that quinine does exert in large doses some influence on the temperature of the human body.

Alcohol, in varying quantities, has been given in twenty cases, with no apparent result in thirteen, six being cases of typhus, and one of typhoid. The remaining seven are as follows:—

CASE 1.—Phosphorus poisoning; chronic bronchitis. Frances —, æt. 48, admitted June 7th, 1869, under Dr. Hilton Fagge.

Temperature.			
June 7th	Morn.	100·3°	Brandy, 10 oz. in the 24 hours.
" "	Even.	98·0°	
" 8th	Morn.	98·0°	
" "	Even.	98·4°	
" 9th	Morn.	99·1°	Brandy 16 oz. " "
" 10th	Morn.	100·0°	From this time it became normal.

CASE 2.—Typhus. George W—, æt. 23, admitted under Dr. Bershon, April 12th, 1869, on sixth day of illness.

Temperature.			
6th day	Morn.	104·5°	
" "	Even.	105·2°	
7th "	Morn.	104·5°	
" "	Even.	101·4°	
8th "	Morn.	102·4°	Pulv. Opii gr. ʒ, Antim. Tart. gr. ʒ, in pil. j every second hour, commenced at 4 p.m.
" "	Even. 10 p.m.	98·8°	
9th "	Morn.	101·0°	
" "	Even.	108·6°	

		Temperature.	
10th day	Morn.	101.4°	Brandy, 8 oz. in the 2
" "	Even.	103.0°	From this time the
			fell quickly down to

CASE 3.—Enterica. Susan E—, æt. 16, admitted u Habershon, October 16th, 1869; has been ill four day:

		Temperature.	
Day of Disease.		Morning.	Evening.
5th	.	104.8°	
6th	.	104.5°	104.7°
7th	.	105.4°	104.8°
8th	.	105.0°	102.2°
9th	.	102.1°	103.0°

Sherry, 8 ou
at 1.30 p.m.

The course of this attack was very prolonged, and perature varied much after this date.

CASE 4.—Enterica. Emma C—, æt. 16, admitted Moxon, September 16th, 1868.

		Temperature.	
Day of Disease.		Morn.	Even.
6th day	.	—	
" "	.	Even.	104.4°
7th "	.	Morn.	103.4°
" "	.	Even.	102.0°
10th "	.	Morn.	105.0°
" "	.	Even.	104.0°
11th "	.	Morn.	102.0°
" "	.	Even.	103.0°
12th "	.	Morn.	102.0°
14th	Wine was increased to 16 oz. without influencing the tem		
	all. The patient had a slight relapse, and she was		
	from the 28th day.		

Port, 4 oz.

The temperature stead
now to the 10th day

Port, 8 oz.

Port, 12 oz.

CASE 5.—Typhus. Edwin C—, æt. 22, admitted Feb 1869, under Dr. Owen Rees. He has been ill four da

		Temperature.	
Day of Disease.		Morn.	Even.
5th day	.	—	
" "	.	Even.	104.2°
6th "	.	Morn.	104.5°
" "	.	Even.	103.2°
7th "	.	Morn.	104.4°
" "	.	Even.	103.4°
9th "	.	Morn.	105.1°
" "	.	Even.	104.4°

Wine, 12 oz.

Brandy, 5 oz., instead

The patient died on the eleventh day.

CASE 6.—Typhus. A female, æt. 45 (about), admit Dr. Pavy, September 10th, 1869.

			Temperature.	
Sept. 10th	.	Morn.	.	—
" "	.	Even.	.	103·6°
" 11th	.	Morn.	.	101·5° Wine 10 oz., brandy 2 oz.
" 12th	.	Morn.	.	101·2°
" "	.	Even.	.	102·8°
" 13th	.	Morn.	.	103·0° Wine 10 oz., brandy 4 oz.
" "	.	Even.	.	102·8°
" 14th	.	Morn.	.	100·8°
" "	.	Even.	.	102·5° Death occurred 2 days later.

CASE 7.—Typhus. Anne C—, æt. 36, admitted under Dr. Habershon, November 22nd, 1868.

Day of Disease.		Temperature.	
7th day	Morn.	.	103·7°
"	Even.	.	104·8°
8th	Morn.	.	104·2° Quinine, gr. ij, every 4 hours. Brandy 6 oz.
"	Even.	.	104·5°
9th	Morn.	.	104·0°
"	Even.	.	103·2°
10th	Morn.	.	98·8°
"	Even.	.	103·5°

Thus, in all four cases of typhus, there was some fall in temperature after the administration of the drug; but in one of these a fall had previously occurred after the exhibition of antimony, and the course was very variable throughout. In another, quinine was given with the alcohol. The temperature fell in one case of enterica; but in a second, though the wine was pushed to 16 oz., the temperature rose instead of falling.

Case 1 is recorded to show the effect of large quantities of alcohol on a comparatively normal temperature.

From these cases, the influence of alcohol on the temperature seems to be much less decided than that of quinine, for while after the latter eleven out of eighteen showed some change, six only out of twenty cases showed any signs of a reduction of temperature, and these not of a very positive character, after the administration of alcohol. There is this to be said, that the mode of administering the drug differed in the two series of cases, the quinine being given in most cases in a single dose, whereas the alcohol was distributed throughout the twenty-four hours. It is also possible that had the observations been made oftener, more decided results would have been obtained. In animals, a lowering of the temperature seems almost constant after the exhibition of alcohol. Dr. C. Binz, of Bonn, lately published in the 'Practitioner' an account of some experiments

on this point. He found that the temperature fell in proportion to the quantity of the drug administered. Thus two cubic centimetres of alcohol, injected subcutaneously, caused a fall of about $\frac{1}{2}^{\circ}$ C. in twenty minutes. A dose of 25 cubic centimetres, introduced into the stomach, caused a fall of 2° C. in four and a half hours, while, in poisonous doses, a fall of 4° to 5° occurred in from one to two hours.

The following observations on a case of tetanus, treated at first with quinine and cannabis indica, and ultimately by nicotine, may be fitly inserted here. I am indebted to Mr. Aikin for some of the temperatures quoted in this case.

Marianne S—, æt. 16, admitted June 18th, 1869, under Dr. Moxon. She has been ill seven days, stiffness about the jaws being the first symptom. There is no sore about the body.

Day of Disease.		Temperature.	
8th	Morn.	100.4°	} Tr. Cannabis Indicæ mxx, Quiniæ Sulph. gr. iij, Stills horis.
"	Even.	100.0°	
9th	Morn.	100.0°	} Rep. Mist. 2dis horis.
"	Even.	100.4°	
10th	Morn.	101.0°	} Tr. Can. Ind. mxx c. Quiniæ gr. iij, 2dis horis.
11th	Even.	102.4°	
12th	2 p.m.	102.6°	} Nicotine m $\frac{1}{2}$ given by mouth at 3.50.
"	4.3	101.4°	
"	9 p.m.	101.0°	
13th	Morn.	101.6°	
"	7 p.m.	100.0°	} Has had m $\frac{1}{2}$ of Nicotine this afternoon. 7.50 p.m. m $\frac{1}{2}$ injected subcutaneously.
"	8 p.m.	100.6°	

From this time, though the remedy was pushed, the temperature gradually rose to 103.6° at her death, on the fourteenth day.

In four experiments, as to the effect produced on the temperature by vapour baths, no marked results were obtained; but in all the surface temperature was slightly increased.

Two were on myself.—In the first the surface temperature rose from 97.5° to 99.4° . In the second the surface temperature rose from 88.8° to 96° . The temperature of the mouth fell in the second experiment from 97.7° to 97° . The temperature of the bath was 90° .

Two others were on cases of scarlatinal dropsy. In the first, the surface rose from 98.9° to 99.4° . The mouth remained stationary at 98.6° . Bath, 92° . In the second, the surface rose from 98.3° to 99.1° , the temperature of the bath being 96° .

No appreciable sweating occurred in the first experiments, and only a very moderate amount in the cases of scarlatinal dropsy.

While on this subject, the following case seems so interesting, that a short note is given of it.

Ada H—, æt. 17, suffering from chronic laryngitis, with a temperature of 98.6° , had tracheotomy performed upon her at 4.30 p.m. She was placed in bed with a blanket next the skin, and steam was freely circulated about her. The atmosphere around was thus kept at about 70° . At 8 p.m. her temperature was 102° . As she was very restless the blanket was exchanged for a linen night-dress and she was put into ordinary sheeting. She soon became much more quiet and went to sleep. The next morning her temperature was 99° , and it did not afterwards rise. It is believed that the external conditions were the cause, in this instance, of the increase of temperature; seeing that a very small amount of chloroform was inhaled, that the operation was attended by no distress or fear, and that the relief was immediate.

It is of course needless to point out the bearings this case may have upon the after-treatment of such operations.

And now comes the question, is any change effected in a patient's condition by lowering the temperature? is he better or worse than he would have been if left alone? Here ague furnishes us with a ready answer, for in this disease the only thing accomplished by quinine is apparently the arrest of rise in the temperature.

The good that is done is here unquestionable. But in saying this, let me not be understood to say that at all times when a high temperature is present, large doses of quinine should be given. The cases above quoted are brought forward to show that no evident harm accrues therefrom. They are also interesting as indicating that we have *some* power by the aid of drugs of influencing and in a measure restoring to normal action those processes of life which deranged make up the state called "fever."

Note.—Since writing the above an interesting review has appeared in the "Lancet" of September 25th, 1869, of works by Liebermeister of Basel, and Jürgensen of Kiel, on the

subject of lowering the temperature in fevers. These physicians have in fact revived the old practice, now long died out, of treating such diseases by cold baths, the cold douche, &c. Liebermeister, in addition to the cold water treatment, gave large doses of quinine. The observations are based on nearly five hundred cases of enterica, and their mortality compared with that of England is given by the reviewer thus :

Jürgensen	.	.	.	3.1 per cent.
Liebermeister	.	.	.	9.8 "
England (Murchison)	.	.	.	16 "

A further trial of this method is needed to verify these results in English practice, but it must be confessed that if these statistics are correct, our treatment will require reconsideration. The question is also raised by the reviewer whether other means, such as sucking ice, &c., might not aid in reducing the temperature. I may say that sucking ice makes no impression on a normal state of temperature, but whether it would be alike useless in abnormal states remains to be proved.

In a case of severe eclampsia where venesection to 30 oz. was resorted to the temperature before the operation was 101.2° . An hour after it was 102.6° . The patient, however, had many fits in the interval, and these may have accounted for the further rise. Again, a patient died by the rupture of a thoracic aneurism into the pleural cavity; the temperature soon after death stood at 99° . It seems, then, that loss of blood does not necessarily imply a reduction of heat.

Such being a résumé of the more interesting features observed during the past year in relation to temperature, it remains to be inquired, do they prove that the thermometer is useful in the daily treatment of disease? Now, it must be admitted at once that there is no chart so typical that, apart from the consideration of other conditions, an opinion can be given on the temperatures alone. The thermometer is no instrument which in difficult cases will do away with responsibility and make a diagnosis. It only serves to render doubt less doubtful, or, to put it more correctly, to bring probability nearer certainty. Is it reasonable to expect more? The statement that no typical chart is known perhaps requires some qualification, for from a chart of typhus or enterica *towards the end of its course* the disease could be

diagnosed almost with certainty; what is meant is that at the onset of disease, the time when a diagnosis has to be made, and when the chief difficulties arise, the temperature will not by itself give a positive indication.

It is often urged against the thermometer that the hand is quite as good an indicator as is needed, and that the question of degree is a matter of no importance; or, again, that the true use of the thermometer is to educate the hand. It appears, however, very doubtful whether thermometric observations really have this effect. At any rate, within the last month the following case has occurred to me.

A patient feeling ill kept her bed for four days; she was seen daily, but because the skin felt cool and moist to the hand the temperature was not taken. On the fourth day as she seemed no better the thermometer was used, and a temperature of 104° was registered. And this is no isolated example.

As an aid to the diagnosis of the exanthemata, it has long been taught that the thermometer generally shows an increase of temperature towards evening, and beyond this great characteristic I know of no special feature which will distinguish between varieties during the early stages. If, however, the temperature should rise to 104° or 105° on the second or third morning, there is a great probability of the attack being no more than what is known as *Febricula*. Two or three cases of this kind have occurred to me. In the first, the patient was advised to go to the Fever Hospital; he was, however, not able to get there till three days after he was first seen, and by that time all traces of fever had quite subsided. On the other hand, I have lately heard of a case where a temperature of 106° was noted on the fourth day of the illness, the onset being sudden and definite, but it has nevertheless developed into well marked typhoid.

The evening exacerbation is often quite sufficient to act upon, and the following cases are given in proof, occurring under Dr. Fagge at the Evelina Hospital.

CASE 1.—Beatrice G—, æt. 3, apparently in perfect health, suddenly vomited her food. The temperature was taken and found to be $99^{\circ}2$. At night it was $101^{\circ}5$. She was now fretful and pallid. There was no eruption present. She was,

however, removed to the Fever Ward, and the scarlatina rash appeared the next morning. Nothing of the kind had been in the ward previously.

CASE 2.—George B—, æt. 2½. A case of measles having occurred in the ward, the temperature of the patient, amongst others, was being registered night and morning. About a week after the occurrence of the first case, the morning temperature was 99°, that of the evening 101°. No eruption was visible, but he had slight nasal catarrh. He was removed from the General Ward, and measles appeared two days afterwards.

I cannot help thinking that in such instances the thermometer would prove most valuable for the prevention as well as the diagnosis of disease. For example, in schools and large collections of children, a known source of contagion (as one previous case) having been imported, the infected might be singled out before any outward manifestation had occurred, if the temperature of every child were noted. Thus many fresh cases might be prevented. This is not by any means an impracticable suggestion, for any intelligent nurse with five minutes' instruction would be capable of making observations which would supply all the information that was necessary. In an exceptional case now and then, no doubt an error would be made on the side of caution, and a child needlessly secluded, but the benefit on the opposite side would far outweigh this evil.

To give another case.

A lady after nursing some children with scarlatina is seized with a very severe sore throat. The tonsils and soft palate are livid and injected, and there is deep ulceration on both sides.

The morning temperature is 98°. Evening temperature 100·4°. Pulse 100. The next morning the temperature was again 98° and a positive diagnosis was then given against the attack being scarlatina. The patient went into the country two days after.

In a first observation the temperature, pulse and respiration should always be compared, as by this means a rough diagnosis may often be made as to whether fever or pneumonia be the malady.

In acute inflammatory affections the evening increase c

temperature is usually absent, the morning temperature being equal to, or even higher than, that of the evening.

In diseases of the skin, as eczema or psoriasis, even when acute, the temperature is not much disturbed. Erythematous eruptions likewise seem to cause very little rise. This might be useful in such cases as copaiba rash, &c. The temperatures of a patient suffering from this affection are given.

Donald M—, æt. 23, admitted under Mr. Birkett, March 3rd, 1869. On March 13th after taking copaiba for a week an eruption like that of measles appeared.

Day of Disease.	Temperature.	
	Morning.	Evening.
2nd .	99·5°	99·8°
3rd .	99·8°	100·0°
4th .	98·3°	98·6°
5th .	98·3°	98·4°

Eruption has now faded from the chest, but still thickly covers the abdomen.

It has been said that the fever in the early stages of typhoid is a progressive one, *i. e.* that the temperature of a given morning will be higher by 1° than that of the day which preceded it, and also that the evening exacerbation is one of about 2°. I should say that a definite course like this must be exceedingly rare, and as a means of diagnosis between enterica and other forms of fever is practically useless.

The diagnosis of typhoid in children is well known to present exceeding difficulty at times, and the thermometer is then capable of rendering us great help. A case in point is given where, excepting the temperature, not a single symptom of the disease was present.

Emma H—, æt. 7, admitted to the Evelina Hospital under the care of Dr. Fagge, October 26th, 1869. She was quite well till twelve days ago, when she was suddenly much purged, the motions were liquid but not offensive. They were dark coloured. She has been a little delirious at nights, and has had much cough. No hæmoptysis.

On admission the child's aspect is dull. The tongue is clean and moist. There is no fulness of the abdomen and no

spots of any kind on the surface. There is much *rhonchus* all over both lungs.

The temperature ran as follows :

Date.	Temperature.	
	Morning.	Evening.
October 26th .	100·6°	101·4°
„ 27th .	100·2°	102·3°
„ 28th .	98·5°	101·0°
„ 29th .	98·0°	101·0°
„ 30th .	97·6°	99·4°
„ 31st .	96·2°	98·5°
November 1st .	98·5°	100·0°
„ 2nd .	99·6°	101·5°
„ 3rd .	99·0°	102·4°
„ 4th .	102·4°	104·0°
„ 5th .	102·4°	103·2°
„ 6th .	102·2°	104·6°
„ 7th .	101·0°	105·0°
„ 8th .	101·6°	103·7°
„ 9th .	101·4°	103·5°
„ 10th .	102·0°	103·2°
„ 11th .	100·2°	103·2°

The normal temperature was not reached till November 20th.

At times the thermometer is of much value in the diagnosis of *ague*. To ordinary observation there is indeed not much difference between the hot stage of *ague* and any other pyrexial state, but a temperature of 107°, though not uncommon in intermittent, is rare in continued fever except in cases of the very worst type. Indeed I think it may be said that excluding *ague* and relapsing fever a temperature of 107° is always fatal.

The following case was diagnosed correctly as *ague* mainly on the strength of one observation by the thermometer.

E. B.— was attacked by very severe rigors a few days after a premature labour; they were thought to be pyæmic in origin. Her temperature was 106·4° when seen. Now though very ill, it was patent to all that she was not in such desperate case as a state of pyæmia with a temperature of 106° would indicate, and *ague* was therefore suggested. On investigation she gave a history of former quotidian *ague*, and she was much relieved by quinine in large doses. The relief was not so complete as

is usual after this treatment, and perhaps some will still doubt whether the case was not really one of those anomalous pyæmic attacks which do sometimes occur after labour.

To give another doubtful case where the thermometer was the chief agent in the diagnosis. Mr. Taylor saw this patient and has furnished me with a note of it.

A patient was admitted into Guy's on the evening of December 3rd, 1869, suffering from bronchitis and emphysema, but his temperature was 104° , and he gave a history of a week's illness. At 10 p.m. the temperature had risen to 106° ; when seen again at 12 midnight he was sweating profusely with a temperature of only 99° . Knowing these facts, a diagnosis was made almost immediately. As far as I know, it could only have been one of two diseases, viz. ague or relapsing fever; the patient having been ill for a week, the probabilities were in favour of the latter, and this eventually proved to be correct.

Again, the thermometer is useful as a means of diagnosing between carcinoma and tubercle. A case illustrating this occurred at Guy's, in November 1868; the patient being extremely emaciated was supposed to have phthisis; but from the fact that the temperature was never high Mr. Reginald Stocker, then house-physician, suggested that this was a case of cancer and not tubercle. A post-mortem afterwards confirmed this view.

In the diagnosis of ulcerative endocarditis, the thermometer would probably be exceedingly useful; in the only case that I have observed in relation to this question the temperature rose at times to 104° . From the nature of the disease, and the cause of death in many of these cases a high temperature would be expected.

Under the head of prognosis the variations in enterica must be once more referred to as often helping to decide the date of the attack. They rarely commence before the middle, and generally not till the end of the third week; a rough estimate can thus be made as to when the patient may be expected to convalesce.

In fevers, other things being favorable, a moderately high temperature does not seem to influence prejudicially the

progress of the case, and *vice versa* a low temperature is by means an index of the levity of the attack. From what has been stated before under typhus, a temperature of 100 or 101 may go with a very severe form of the disease. Of the extremes in the worst forms of fever, I think, though I cannot adduce any proof, that a very high temperature is the most favorable. Probably, however, both only occur as a part of the act of dying; and while the one (high temperature) gives evidence of almost total cessation of nerve-function, the other may be explained by supposing it to be the result of a quivering rigor mortis of the cutaneous vessels occurring during the last hours of life. Much has been said as to the value of the thermometer in foretelling a fatal termination from sudden fall of the mercurial column or the reverse. These, however, do not generally occur until other symptoms have already manifested what issue the case will have.

In conclusion it may be interesting to look at the thermometer from a medico-legal view, and the results of some observations made at the suggestion of Dr. Wilks are given in the cooling of the body during life.

Medical evidence is most often required on this point in cases in which the question of homicide or suicide turns on the length of time a body has been dead. Now in a majority of cases it might be assumed that the deceased at the time of death was in a state of health. Supposing, then, that death is immediate (on the assumption that the normal temperature is never below 96°) one would be justified in giving a positive opinion that the temperature of the body before death was between 96° and 99°, and inferences as to the time of death could be made from such data.

The question then resolves itself into—

- 1st. What influence would the condition of shock, collapse, &c. exert on the temperature if the act of dying lasted some time?
- 2nd. How far would disease be likely to act upon the normal temperature, and thus lead to the giving of an erroneous opinion.

On the first point it may be observed that in collapse, as seen in peritonitis, the temperature is usually rather above than below normal. In cases of shock from severe railway

accidents, the temperature is below normal, but not below 95°, while of two cases of death from internal hæmorrhage, one had a temperature of 99° at the time of death, the other a temperature of 96°.

In severe abdominal injuries the temperature, though generally rather below normal, is never much reduced.

In considering disease in relation to the *reduction* of temperature, it must be remembered that in cholera and relapsing fever the thermometer often rises no higher than 98°, but such exceptional cases as these could hardly complicate a medico-legal inquiry. On the other hand, from what we know of the thermometrical changes in disease, it is possible that very sudden *elevations* of temperature might occur from altered conditions of nerve-function.

In order, however, to supply more accurate information as to the influence of the act of dying on the temperature, a table is subjoined of observations made on forty-three patients when each appeared to be "in articulo." This condition lasted in some for three or four hours after the temperature was taken, in others only a few minutes.

No.	Name.	Age.	Disease.	Temperature in Axilla.	REMARKS.
1	J. T.	47	Mitral	97°	Looks blue. Surface feels cold.
2	J. O.	45	Railway Accident	95°	Surface cool and moist. Temperature in lacerated wound over biceps humeri 88°.
3	J. H.	40	Renal	102·7°	Sensible.
4	E. F.	2	Croup	102·4°	
5	E. L.	60	Stricture of œsophagus	97·3°	Is much wasted. Very little solid food taken for thirty-two days.
6	M. W.	40	Mitral	94·6°	Pulseless. Surface cold.
7	G. M.	64	Pleuritic effusion	96·3°	
8	D. B.	30	Intestinal obstruction	93·6° R. 92·4° L.	Extreme emaciation. Has taken very little food for weeks.
9	J. B.	38	Abscess of liver	93°	Embolus of left pulmonary artery caused death. Is extremely anæmic.
10	S. M'G.	24	Albuminuria	101°	
11	S. W.	39	Gout, albuminuria	95·2°	A sudden rise to 105°, and a sudden fall to normal again took place during life.

No.	Name.	Age.	Disease.	Temperature in Axilla.	REMARKS.
12	M. A.	35	Uræmia	93°	Nine hours before death temp. 91°.
13	C. H.	43	Thoracic aneurism	99°	Very livid.
14	R. S.	23	Morbus cordis	101°	Scrotum gangrenous.
15	M. T.	23	Enterica	103°	Death from peritonitis.
16	B. F.	23	Enterica	106·5°	Death after passing a large quantity of blood.
17	S. M.	49	Carcinoma of liver	100°	Pulseless.
18	E. T.	—	Phthisis and morbus cordis	98·7°	Surface always cold during life.
19	E. C.	22	Typhus	105·5°	
20	W. B.	32	Albuminuria; meningitis	101·2°	Is drowsy.
21	J. J.	14	Pyæmia	109·3°	Semiconscious.
22	H. B.	21	Renal?	101·6°	Coma preceding death.
23	W. K.	8	Scarlatina	102·5°	
24	N. V.	16	Enterica	103°	Peritonitis.
25	J. S.	54	Suppurating kidney	103·6°	Coma.
26	—	35 abt.	Fractured skull	101·6°	
27	G. W.	37	Apoplexy	106·2°	
28	C. B.	62	Disease of cardiac end of stomach	97·6°	Feels very cold to the hand—
29	J. C.	60	Malignant of liver	90·4°	Much wasted.
30	A. S.	17	Tetanus	104·2°	
31	C. M. C.	6	Tubercular meningitis	99·8°	Insensible.
32	H. P.	7 wks.	Marasmus	95·3°	
33	W. B.	26	Tubercular meningitis	100°	
34	G. D.	19	Diphtheria	102·4°	Half an hour before death, when he was apparently comfortable.
35	E. B.	17	Acute rheumatism	105·1°	
36	L. M.	18	Enterica	107·2°	
37	W. M.	20	Enterica	104·1°	Pulseless; peritonitis; perforation.
38	M. H.	10	Tetanus	103·4°	
39	E. H.	19	Hydatid of heart	98°	Feels cold. Is rather blue. Much dropy.
40	M. S.	42	Uræmia; gout	105·5°	
41	W. H.	88	Syphilis; albuminuria; phthisis	96°	
42	J. R.	26	Pneumothorax	96·4°	Very livid. Surface cool. Sweating.
43	W. C.	67	Carcinoma of spine	97·5°	

Of forty-three cases here recorded, thirty-five had a temperature at or above normal (between 96° and 98·6° being considered a normal range) at the time of death. Of the eight in which it was below that point, one case was that of man severely injured by a railway accident, the second was case of heart disease, the third was a case of intestinal obstruction, with much emaciation after starvation, the fourth was one

extreme anæmia and emaciation from prolonged suppuration, fifth and sixth occurred in albuminuria, the seventh was case of malignant disease of the liver, and the eighth was that of a child much wasted.

From this limited number of cases, then, it appears—

1st. That except in isolated instances, and these cases of long-standing disease with emaciation, the temperature is not materially lowered at the time of death.

2nd. That while a rapid rise of temperature is often observed, it occurs not in such cases as those of death from hemorrhage, accidents, collapse, &c., but rather in patients who are already so seriously ill that a difficulty with regard to them could scarcely arise.

CASES
ILLUSTRATING THE INFLUENCE OF
OPIUM AND SOME OF ITS CONSTITUENT
PRINCIPLES
IN CONTROLLING
THE ELIMINATION OF SUGAR IN DIABETES.

By F. W. PAVY, M.D., F.R.S.

THE following cases so plainly speak for themselves that but few prefatory remarks are needed. Opium, morphia, codeine, narcotine and narceine, have formed the agents administered. There has been no selection in the cases brought forward. In order that a faithful representation might be made, I have introduced, with one exception only, all the cases that have fallen under my charge within the hospital since the plan of treatment was commenced. The excepted case was that of a patient who was only in the hospital for a short time, and who came to me from having been previously subjected to the opium-treatment elsewhere.

No one, I think, will rise from the perusal of these cases without being prepared to concede that evidence has been adduced of the possession of a direct controlling power by certain of the agents used over the elimination of sugar in diabetes. For my own part, I may state that I have never hitherto been able to accomplish, by medical treatment in diabetes, the same or anything like the same that I have been accomplishing lately. Of the agents as yet tried, opium, morphia, and codeine are those which may be spoken of as evidently enjoying the power mentioned. In two of the cases belonging to this communication I gave narcotine to the extent of five

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rains three times daily without observing any visible effect. Narceine I have only tried once, and then it did not seem to exert the slightest action. Moreover, narceine is a very insoluble principle, and doubts may be entertained if much of what is administered gets absorbed into the system.

Of opium, morphia, and codeine, the last, I consider, possesses the most advantageous properties. As far as my experience, including that amongst hospital in-patients and out-patients and in private practice, enables me to judge, I cannot help thinking that codeine will be found to prove a valuable agent in the treatment of diabetes. In some cases it appears to possess the power of exerting a direct curative action. In others, however, although it has been found, particularly for a while, to control the elimination of sugar and improve the general condition, yet it must unhappily be said that it has afterwards proved powerless in averting an unfavorable termination.

The great advantage of codeine over opium and morphia is that it is equally efficacious in controlling the disease, and does not exert the same narcotic effect. When given in a small dose to begin with, and increased gradually, nothing may be perceived beyond its effect upon the disease. Half a grain I consider an appropriate dose to begin with, and, as seen by the following cases, I have given it to the extent of ten grains three times daily. Beginning with one grain three times a day, a little drowsiness, giddiness, and perhaps headache, may be complained of. I have begun with two grains three times a day; but the dose had to be reduced to one grain on account of the disturbance of the cerebral functions that was produced. Under its employment I have not observed the pupils to become contracted, nor have I noticed any marked constipating action. It may, perhaps, have a little tendency this way, but nothing certainly to any marked extent. The tongue, in some of the cases, I have particularly noticed to be conspicuously lean and moist. The appetite, as a rule, has not been affected by it.

In all the following cases the agents were administered in the form of pill. I think it desirable, for the sake of precision, to mention that it was from Mr. Morson, of Southampton Row, that the codeine, narcotine, and narceine employed were obtained.

I consider that the only way of obtaining precise informa-

tion about the action of an agent administered in diabetes is through a daily analytical examination of the urine. The patients in the hospital under my charge, whose cases are forming the subject of observation, are directed to preserve all the urine passed from a certain hour one day up to the same hour the next. After all has been mixed together and the quantity ascertained, a specimen is taken to my physiological laboratory for examination. Here the sp. gr. is noted, and a quantitative determination of the sugar effected. Thus it was that the several results mentioned in the following cases were obtained.

Enumeration of the cases, showing the agents respectively administered.

<i>Case.</i>	<i>Agents administered.</i>	<i>Case.</i>	<i>Agents administered.</i>
No. 1 .	Opium.	No. 6 .	Narcotine, codeine.
" 2 .	Opium.	" 7 .	Narcotine, codeine.
" 3 .	Morphia.	" 8 .	Codeine.
" 4 .	Nepenthe, extract of opium, morphia, codeine.	" 9 .	Codeine.
" 5 .	Morphia, opium, nar- cotine, codeine.	" 10 .	Codeine.
		" 11 .	Codeine.
		" 12 .	Codeine.
		" 13 .	Codeine.

CASE 1.—Treated with opium.

John D—, æt. 50, admitted into Guy's Hospital, under Dr. Pavy's care, April 1st, 1868; a married man, who had enjoyed good health until fifteen months ago, when his present complaint set in with great thirst, loss of flesh and strength, and a frequent desire to pass water, the quantity of which was much increased beyond what he had hitherto been accustomed to pass. His gums became tender, his teeth loose, and some of them decayed. His bowels had been obstinately confined.

He is a slight-built man, skin dry and rough, tongue clean and dry, mouth feels parched; complains of considerable thirst; appetite excessive, and a feeling of sinking or emptiness at the pit of the stomach often experienced; breath presents the characteristic diabetic odour; urine highly charged with sugar, no albumen; heart and lungs healthy.

Upon admission the patient was put upon a restricted diet, and ordered to take an alkaline mixture. This was continued through the month of April, and glycerine was also administered, to ascertain its effect upon the urine. It was only at the commencement of May that the opium treatment was begun, and hence it is at this date that the following daily report is made to commence.

Quantity of urine per 24 hours.			Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
pts.	oz.	Sp. gr.	grains.	grains.			
2 ... 2	5 ...	1038 ...	26·64 ...	1198			
3 ... 2	5 ...	1032 ...	14·40 ...	648	} Pulv. Opil gr. j, bis die		
4 ... 2	5 ...	1032 ...	14·40 ...	648			
5 ... 2	5 ...	1035 ...	14·40 ...	648			
6 ... 2	15 ...	1032 ...	15·63 ...	859	} Pulv. Opil gr. j, ter die		
7 ... 3	5 ...	? ...	17·55 ...	1140			
8 ... 3	... ..	1040 ...	25·71 ...	1542			
9 ... 2	15 ...	1040 ...	24·80 ...	1364	} Pulv. Opil gr. iij, ter die		
10 ... 3	5 ...	1037 ...	30· ...	1950			
... 4	... ..	1047 ...	42·33 ...	3386*			
... 2	... ..	1040 ...	24·81 ...	992	} Pulv. Opil gr. iijss, ter die		
... 2	5 ...	1031 ...	11·40 ...	513			
... 3	... ..	1025 ...	7·80 ...	468			
... 2	... ..	1027 ...	2·52 ...	100	} Pulv. Opil gr. iij, ter die		
... 2	... ..	1026 ...	3·58 ...	143			
... 2	... ..	1027 ...	Trace of sugar	...			
... 2	... ..	1022 ...	Do. ...	...	} Pulv. Opil gr. iijss, ter die		
... 2	... ..	1024 ...	No sugar	...			
... 1	10 ...	1027 ...	Do. ...	...		
... 1	15 ...	1025 ...	Do. ...	...	} Restricted diet.		
... 2	... ..	1026 ...	Trace of sugar	...			
... 1	10 ...	1027 ...	No sugar	...			
... 2	5 ...	1025 ...	Do. ...	...	} Pulv. Opil gr. iv, ter die		
... 2	15 ...	1027 ...	3·11 ...	171			
... 2	... ..	1032 ...	5·21 ...	208			
... 2	5 ...	1030 ...	4·28 ...	192	} Pulv. Opil gr. ivss, ter die		
... 2	... ..	1029 ...	2·40 ...	96			
... 2	... ..	1030 ...	3·63 ...	145†			
... 2	... ..	1033 ...	2·85 ...	114	} Pulv. Opil gr. v, ter die		
... 2	... ..	1030 ...	3·24 ...	129			
... 1	15 ...	1028 ...	2·92 ...	102			
... 1	15 ...	1026 ...	No sugar	...	} Pulv. Opil gr. vss, ter die		
... 1	15 ...	1027 ...	Trace of sugar	...			
... 1	15 ...	1027 ...	Do. ...	...		
... 1	10 ...	1028 ...	Do. ...	...	} Pulv. Opil gr. vj, ter die		
... 1	15 ...	1027 ...	Do. ...	...		
... 1	15 ...	? ...	No sugar	...			
... 1	10 ...	? ...	Trace of sugar	...	} Aq. Camph. 3j, ter die. Omit- tatur Pulv. Opil		
... 1	10 ...	1025 ...	No sugar	...			
... 1	15 ...	1025 ...	Trace of sugar	...			
2 ... 1	15 ...	1032 ...	4· ...	140			
3 ... 1	10 ...	1036 ...	4· ...	120			
4 ... 2	... ..	1032 ...	8·57 ...	342			
5 ... 2	... ..	1037 ...	20· ...	800			
6 ... 1	15 ...	1037 ...	11·40 ...	399			
7 ... 2	... ..	1048 ...	26·64 ...	1065			

* Flour biscuits eaten.

† Patient admitted that he was sometimes partaking of prohibited food.

Cases of Diabetes treated by Opium

te.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.		Medicine.
	pt ⁴ . oz.	Sp. gr.	grains.	grains.			
ne 18 ...	2	...	1041 ...	17.13	...	685	Aq. Camph. 3j, ter die. Omit- tatur Pulv. Opii
" 19 ...	1 15	...	1040 ...	17.55	...	614	
" 20 ...	2	...	1036 ...	18	...	720	
" 22 ...	2 10	...	1042 ...	34.26	...	1713	
" 23 ...	2 10	...	1040 ...	23.22	...	1161	
" 24 ...	3	...	1038 ...	24	...	1440	Pulv. Opii gr. j, ter die
" 25 ...	2 10	...	1042 ...	24	...	1200	
" 26 ...	2	...	1044 ...	27.69	...	1107	
" 27 ...	2	...	1047 ...	39.99	...	1599	
" 28 ...	2 10	...	1043 ...	36	...	1800	
" 29 ...	1 15	...	1040 ...	30	...	1050	Pulv. Opii gr. ij, ter die
" 30 ...	2 5	...	1041 ...	22.50	...	1012	
July 1 ...	2 5	...	1042 ...	23.22	...	1044	
" 2 ...	2 15	...	1033 ...	15.63	...	859	Pulv. Opii gr. iij, ter die
" 3 ...	2 5	...	1037 ...	19.44	...	874	
" 4 ...	2	...	1035 ...	11.67	...	586	
" 5 ...	2 15	...	1037 ...	28.80	...	1584*	Pulv. Opii gr. iijss, ter die
" 6 ...	3	...	1042 ...	37.89	...	2273	
" 7 ...	2	...	1038 ...	18	...	720	
" 8 ...	2	...	1031 ...	10.56	...	422	Pulv. Opii gr. iv, ter die
" 9 ...	2 10	...	1032 ...	7.89	...	394	
" 10 ...	2	...	1031 ...	10.26	...	410	
" 11 ...	2 10	...	1032 ...	9.81	...	492	Pulv. Opii gr. ivss, ter die
" 12 ...	2	...	1033 ...	10.26	...	410	
" 13 ...	2	...	1031 ...	6.78	...	271	
" 14 ...	2	...	1028 ...	4.50	...	180	Pulv. Opii gr. v, ter die
" 15 ...	1 15	...	1030 ...	6	...	210	
" 16 ...	2	...	1030 ...	4.80	...	192	
" 17 ...	2	...	1032 ...	9.45	...	378	Pulv. Opii gr. vi, ter die
" 18 ...	2 5	...	1033 ...	12	...	540	
" 22 ...	1 15	...	1033 ...	10.89	...	381	
" 23 ...	2	...	1032 ...	6.31	...	252	Pulv. Opii gr. vii, ter die
" 24 ...	1 15	...	1030 ...	Slight sugar	...	...
" 25 ...	2	...	1021 ...	No sugar	...	...
" 26 ...	2	...	1030 ...	5.85	...	234	Pulv. Opii gr. vii, ter die
" 27 ...	2	...	1026 ...	4.52	...	180	
" 28 ...	1 15	...	1031 ...	5.52	...	193	
" 29 ...	2	...	1029 ...	8	...	320	Pulv. Opii gr. vii, ter die
" 30 ...	2 10	...	1028 ...	9.72	...	436	
" 31 ...	2 5	...	1027 ...	5.84	...	262	
Aug. 1 ...	2 10	Not examined		Pulv. Opi ter die
" 2 ...	2 10			...	...	...
" 3 ...	2 5			...	...	...
" 4 ...	2 5			...	...	...
" 5 ...	2 10	Not examined		Pulv. Opi ter die
" 6 ...	2 5			1033 ...	17.13	770+	
" 7 ...	2 5			1033 ...	14.40	648	

This case strikingly exemplifies the effect of opium in controlling the elimination of sugar. The patient had been in the hospital, and upon a restricted diet for about a month before the above report commences, and the sugar had not been lower than about 1000 grains per diem. Under the gradually increased dose of opium the sugar in a very direct manner declined and disappeared.

June 11th.—The urine having been previously devoid of sugar, the opium was suddenly taken off, and a draught of camphor mixture given in its place. The urine once became charged with sugar, and in thirteen days' time the quantity passed amounted to 1440 grains for the twenty-four hours. The opium was now resumed, and its effect upon the urine is again exceedingly obvious. There is seen, however, to be a daily variation in the state of the urine, a limited amount of sugar continuing to be passed. This evidently arose from the patient having become more careless as regards his diet. He felt well in himself, and from his urine being natural in quantity, he fancied that he had been cured, and did not see the necessity of paying such strict attention to diet as he had formerly done. He was, moreover, anxious to return to his home, and therefore did not mind being told that he would not be kept in the hospital if he did not strictly adhere to the diet ordered. Under these circumstances he was discharged, the quantity of opium administered having reached twenty-one grains per diem.

CASE 2.—*Treated with opium.*

This case was communicated to the Clinical Society in December of last year. Although reported in the Society's 'Transactions,' yet I feel it necessary to introduce here to make this collection of cases complete.

The same patient will further on form the subject of notice in reference to the administration of codeine, which was given to her for a recurrence of her complaint some months after her first recovery.

Sarah P—, aged at the date of admission under my care into Miriam Ward (May 5th, 1868) 68 years. A single woman, who, previous to being affected with her present complaint, had enjoyed good health. Her occupation had been that of a nurse in private families. Four years back she began to experience an inordinate sensation of thirst and hunger, and two years afterwards it was ascertained that she was suffering from diabetes mellitus. Has been passing about five pints of urine a day, and, with this, has been gradually losing flesh and strength.

Upon admission it was found that the patient was passing highly saccharine urine. No albumen was present. Her various organs appeared to be in a healthy condition. She was placed upon an ordinary mixed diet, and opium administered in the manner shown in the subjoined report. She also took throughout a draught consisting of 10 grains of bicarb. of potash, 3ss of the aromatic spirit of ammonia, and ℥j of the inf. of calumba, three times a day.

Cases of Diabetes treated by Opium

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.			
May 26 ...	5	...	1040	...	3275	None	
" 27 ...	4 10	...	1045	...	4050	Pulv. Opii gr. ss, ter die	
" 28 ...	4	...	1042	...	3600		
" 29 ...	4	...	1042	...	3840		
" 30 ...	4	...	1044	...	3920		
" 31 ...			Not examined.			Pulv. Opii gr. j, ter die	
June 1 ...	3 10	...	1042	...	3360	Pulv. Opii gr. jss, ter die	
" 2 ...	3 10	...	1042	...	3150		
" 3 ...	3 15	...	1044	...	3187		
" 4 ...	4 10	...	1039	...	3825		
" 5 ...	3 10	...	1041	...	3150	Pulv. Opii gr. ij, ter die	
" 6 ...	3 10	...	1043	...	3360		
" 7 ...	3 10	...	1040	...	2975		
" 8 ...	3	...	1044	...	2400		
" 9 ...	2 10	...	1040	...	2000	Pulv. Opii gr. ijss, ter die	
" 10 ...	2 10	...	1039	...	2000		
" 11 ...	3 5	...	1038	...	2470		
" 12 ...	2 10	...	1040	...	2000		
" 13 ...	2 10	...	1037	...	1900	Pulv. Opii gr. ijss, ter die	
" 14 ...	2 15	...	1042	...	1801		
" 15 ...	2 10	...	1039	...	1800		
" 16 ...	1 10	...	1042	...	1027		
" 17 ...	1 15	...	1040	...	1093	Omittatur Pulv. Opii	
" 18 ...	1 10	...	1043	...	862		
" 19 ...	1 10	...	1039	...	825		
" 20 ...	1 10	...	?	...	1267		
" 21 ...	1 15	...	1046	...	1690	Pulv. Opii gr. j, ter die	
" 22 ...	1 10	...	1038	...	795		
" 23 ...	1 15	...	1047	...	1575		
" 24 ...	1 15	...	1043	...	1321		
" 25 ...	2	...	1048	...	1370	Pulv. Opii gr. ijss, ter die	
" 26 ...	1 15	...	1045	...	1321		
" 27 ...	1 10	...	1042	...	1080		
" 28 ...	2	...	1043	...	1800		
" 29 ...	1 15	...	1021	...	498	Pulv. Opii gr. jss, ter die	
" 30 ...	2	...	1036	...	960		
July 1 ...	2	...	1037	...	1200		
" 2 ...	2	...	1038	...	1150		
" 3 ...	2	...	1039	...	1370	Pulv. Opii gr. ij, ter die	
" 4 ...	2 10	...	1040	...	1637		
" 5 ...	3	...	1042	...	2160		
" 6 ...	2	...	1041	...	1310		
" 7 ...	2	...	1040	...	1440	Pulv. Opii gr. ijss, ter die	
" 8 ...	1 10	...	1033	...	697		
" 9 ...	2	...	1038	...	900		

Ordinam.
mixed diet

Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.		Medicine.	Diet.
pts. oz.	Sp. gr.	grains.	grains.	grains.			
0 ... 1 15 ...	1034 ...	16½ ...	577		} Pulv. Opii gr. iij, ter die		
1 ... 1 10 ...	1042 ...	24 ...	720				
2 ... 1 10 ...	1040 ...	30 ...	900		} Pulv. Opii gr. ijsa, ter die		
3 ... 1 10 ...	1037 ...	28½ ...	862				
4 ... 1 10 ...	1040 ...	28½ ...	862		} Pulv. Opii gr. iij, ter die		
5 ... 1 5 ...	1040 ...	23½ ...	718				
6 ... 1 10 ...	1036 ...	28½ ...	862				
7 ... 1 5 ...	1039 ...	24 ...	600				
8 ... 1 10 ...	1040 ...	28½ ...	862				
20 ... 1 5 ...	1039 ...	27½ ...	687				
21 ... 1 10 ...	1038 ...	25½ ...	772				
22 ... 1 5 ...	1035 ...	14½ ...	362				
23 ... 1 5 ...	1039 ...	19 ...	475				
24 ... 1 10 ...	1034 ...	21½ ...	652				
25 ... 1 10 ...	1033 ...	15½ ...	457				
26 ... 1 10 ...	1030 ...	16 ...	480				
27 ... 1 15 ...	1015 ...	4½ ...	166				
28 ... 1 5 ...	1027 ...	None ...				Pulv. Opii gr. iij, ter die	
29 ... 1 ...	1028 ...	7½ ...	145				
30 ... 1 5 ...	1031 ...	14½ ...	362				
31 ... 1 10 ...	1027 ...	11½ ...	337				
1 ... 1 ...	1023 ...	Trace ...			} Ordinary mixed diet.		
2 ... 1 5 ...	1022 ...	None ...					
3 ... 1 10 ...	1020 ...	Do. ...					
4 ... 1 5 ...	1020 ...	Do. ...					
5 ... 1 ...	1023 ...	Do. ...					
6 ... 1 5 ...	1020 ...	Trace ...					
7 ... 1 10 ...	1016 ...	None ...					
8 ... 1 10 ...	1017 ...	Do. ...					
9 ... 1 5 ...	1018 ...	Do. ...					
10 ... 1 15 ...	1014 ...	Do. ...					
11 ... 1 10 ...	1024 ...	Do. ...					
12 ... 1 10 ...	1020 ...	Do. ...					
13 ... 1 15 ...	1014 ...	Trace ...					
14 ... 2 ...	1017 ...	None ...					
15 ... 1 10 ...	1017 ...	Do. ...					
16 ... 1 10 ...	1017 ...	Do. ...					
17 ... 1 10 ...	1020 ...	Trace ...			} Pulv. Opii gr. iv, ter die		
18 ... 1 15 ...	1013 ...	Do. ...					
19 ... 1 10 ...	1015 ...	Do. ...					
20 ... 2 ...	1016 ...	None ...					
21 ... 1 15 ...	1016 ...	Do. ...					
22 ... 2 ...	1016 ...	Trace ...					
23 ... 2 ...	1020 ...	None ...					
24 ... 2 ...	1016 ...	Do. ...					
25 ... 2 ...	1015 ...	Do. ...					

Cases of Diabetes treated by Opium

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.		Medicine.	Diet
	pts. oz.	Sp. gr.	grains.	grains.				
Aug. 26	1 15	...	1014	...	None	...	Pulv. Opii gr. iv, ter die	Ordina mixed di
" 27	2	...	1012	...	Do.	...		
" 28	1 15	...	1015	...	Do.	...		
" 29	2	...	1011	...	Do.	...		
" 30	2	...	1015	...	Do.	...		
" 31	1 15	...	1013	...	Do.	...		
Sept. 1	1 10	...	1018	...	Do.	...		
" 2	1 5	...	1020	...	Do.	...		
" 3	2	...	1016	...	Do.	...		
" 4	1 15	...	1020	...	Do.	...		
" 5	1 10	...	1016	...	Do.	...		
" 6	2 5	...	1017	...	Do.	...		
" 7	1 15	...	1016	...	Do.	...		
" 8	1 10	...	1020	...	Do.	...		
" 9	2	...	1016	...	Do.	...		
" 10	1 15	...	1018	...	Do.	...		
" 11	2	...	1016	...	Do.	...		
" 12	2	...	1017	...	Do.	...		
" 13	1 15	...	1018	...	Do.	...		
" 14	2	...	1019	...	Do.	...		
" 15	1 15	...	1019	...	Do.	...		
" 16	2	...	1017	...	Do.	...		
" 17	2	...	1017	...	Do.	...		
" 18	2	...	1017	...	Do.	...		
" 19	2	...	1016	...	Do.	...		
" 20	2 10	...	1021	...	Do.	...		
" 21	2 15	...	1019	...	Do.	...		
" 22	2 10	...	1019	...	Do.	...		
" 23	2	...	1016	...	Do.	...		
" 24	2 5	...	1016	...	Do.	...		
" 25	2 5	...	1017	...	Do.	...		
" 26	2 10	...	1016	...	Do.	...		
" 27	2 5	...	1020	...	Do.	...		
" 28	2	...	1019	...	Do.	...		
" 29	2 10	...	1018	...	Do.	...		
" 30	2	...	1019	...	Do.	...		
Oct. 1	2 10	...	1018	...	Do.	...		
" 2	2 5	...	1019	...	Do.	...		
" 3	2	...	1015	...	Do.	...		
" 4	2 5	...	1017	...	Do.	...		
" 5	2 10	...	1017	...	Do.	...		
" 7			Not examined.					
" 11	2 5	...	1020	...	None	...		
" 12	2 10	...	1014	...	Do.	...		
" 13	2 10	...	1021	...	Do.	...		
" 14	2	...	1020	...	Do.	...		
	</							

Quantity of urine per 24 hours.				Quantity of sugar per fluid ounce.				Quantity of sugar per 24 hours.				Medicine.	Diet.				
pts. oz.				Sp. gr.				grains.				grains.					
15	...	2	10	...	1020	...	None	} Pulv. Opii gr. j, ter die				} Ordinary mixed diet.			
16	...	2	5	...	1018	...	Do.	...	...						
17	...	2	...	...	1019	...	Do.	...	...						
18	...	2	10	...	1020	...	Do.	...	...						
19	...	2	5	...	1021	...	Do.	...	...						
20	...	2	15	...	1015	...	Do.	} Omittatur Opii							
21	...	2	...	...	1022	...	Do.	...	...						
22	...	1	10	...	1025	...	Do.	...	...						
24	...	2	...	...	1030	...	Do.	...	...						
25	...	1	15	...	1020	...	Do.	...	...						
26	...	2	5	...	1030	...	Do.								
27	...	1	15	...	1019	...	Do.	...	...						
28	...	2	...	...	1025	...	Do.	...	...						

Remarks.—In this case it will be observed the patient was completely relieved of her complaint by the agency of opium, without any restriction in diet being resorted to. Moreover, before she was discharged from the hospital her medicine was taken off, and the urine continued free from sugar.

The first effect of the opium was to produce a diminution in the flow of urine, the degree of saturation with sugar remaining for a little time about the same. Between May 27th and June 15th the dose of opium was raised to 3½ grains three times a day. The opium was now suddenly taken off on account of an undesirable amount of drowsiness having been produced. June 21st it was commenced again, and this time the dose more gradually increased. The report shows how the sugar declined and ultimately disappeared. With the improvement in the state of the urine the patient regained her health and strength, and ultimately expressed herself as feeling perfectly well in every respect. It may be remarked that no constipation was observed, and beyond the drowsiness that was at one time produced nothing unfavorable was perceived. After her discharge from the hospital the patient was desired to attend from time to time amongst the out-patients, and her case was thus watched till May 28th, 1869, when she was presented for the second time at a meeting of the Clinical Society. Her urine was then, as it had been found each time before when she attended at the hospital, devoid of sugar.

CASE 3.—Treated with morphia.

John M—, æt. 45, No. 6, John Ward. Admitted July 4th, 1868. The history is drawn from the report of Mr. G. R. Nunn. A married man, and a cooper by trade. No family history of diabetes. In 1859 suffered from gout for a few days, and in 1864 from an attack of rheumatic gout. During the last four years has been falling away in flesh. For many years he was quite fifteen stone in weight, but now he only weighs a little upwards of eleven and a half stone. About the month of July, 1866, noticed that he was feeling very thirsty, and that he was obliged to rise in the night to pass water. His thirst increased, and became such that, however much he might drink, he did not feel relieved. During the October following became an out-patient at Guy's Hospital, and was subsequently admitted in February 1867, as an in-patient, and remained in the hospital for about two months, obtaining benefit from the treatment to which he was subjected. During the early part of the summer of 1868 he attended again as an out-patient, and fell under Dr. Pavy's care, who took him into the hospital on July 4th. Before admission he had been suffering from cramp in the legs at night. His urine is pale in colour, of a sp. gr. 1040, and highly charged with sugar, but not albuminous. His tongue is much coated. Appetite capricious. Complains of general weakness. Is in a spare but not what can be called an emaciated condition. Heart and lungs healthy.

Date.	Quantity of urine per 24 hours.			Quantity of sugar per fluid ounce.			Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts.	oz.	Sp. gr.	grains.	grains.				
July 6 ...	7	10	...	1042	...	39.99	...	5998	} Ordinary mixed diet.
" 7 ...	9	...	...	1045	...	48	...	8640
" 8 ...	10	...	...	1042	...	42.33	...	8466
" 9 ...	9	10	...	1040	...	23.22	...	4411	
" 10 ...	6	...	...	1033	...	14.10	...	1692
" 11 ...	5	10	...	1024	...	12	...	1320	
" 12 ...	5	...	...	1026	...	13.56	...	1356
" 13 ...	5	10	...	1030	...	23.22	...	2554	
" 14 ...	5	15	...	1026	...	13.32	...	1531	
" 15 ...	4	5	...	1025	...	12.39	...	1053	
" 16 ...	4	10	...	1025	...	Slight sugar	...		
" 17 ...	5	...	...	1031	...	16.35	...	1635
" 18 ...	5	...	...	1026	...	11.62	...	1162
" 22 ...	4	15	...	1027	...	13.56	...	1288	} Restricted diet.
" 23 ...	4	...	...	1028	...	11.07	...	885
" 24 ...	4	10	...	1030	...	16.59	...	1493	
" 25 ...	6	10	...	1026	...	12.18	...	1583	
" 26 ...	5	10	...	1029	...	15.99	...	1758	
" 27 ...	6	...	...	1030	...	21.15	...	2538
" 28 ...	5	...	...	1033	...	19.98	...	1998
" 29 ...	6	...	...	1030	...	17.13	...	2055
" 30 ...	8	1028	...	21.81	...	3489	
" 31 ...	6	1028	...	18	...	2160	

Pot. Bicarb. gr. xv, Sp. Amm. Ar. 3ss, Aq. Camph. 3j, ter die	
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Date.	Quantity of urine per 24 hours.	Quantity of sugar per fluid ounce.	Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.	
Aug. 1 ...	5	} Not examined	{ Pot. Bicarb. gr. xv, Sp. Amm. Ar. 3ss, Aq. Camph. ʒj, ter die	} Restricted diet.
" 2 ...	4 5				
" 3 ...	6				
" 4 ...	5 10				
" 5 ...	5				
" 6 ...	5	... 1031	... 16.59	... 1659	
" 7 ...	3 10	... 1031	... 18	... 1260	
" 8 ...	4 10	} Urine not examined	...	{ Morph. Hydroch. gr. ss, ter die	
" 9 ...	4 15				
" 10 ...	5				
" 11 ...	4 5				
" 12 ...	5				
" 13 ...	5				
" 14 ...	4 10				
" 15 ...	4				
" 16 ...	4 10				
" 17 ...	4				
" 18 ...	3	} Morph. Hyd. gr. j, ter die			
" 19 ...	4 15				
" 20 ...	3 10				
" 21 ...	3 15				
" 22 ...	4 5				
" 23 ...	4				
" 24 ...	4				
" 25 ...	4				
" 26 ...	4 10				
" 27 ...	4		... 1024	} Morph. Hydr. gr. jss, ter die	
" 28 ...	3 10	... 1025			
" 29 ...	3 10	... 1025			
" 31 ...	2 5	... 1025			
Sept. 1 ...	? ...	1027			
" 2 ...	2 15	... 1030	} Urine saccharine, but quantity of sugar not determined	{ Mist. Hæmatoxyli co. ʒj, 4tis vel 6tis horis	
" 3 ...	2 15	... 1030			
" 4 ...	3	... 1028			
" 5 ...	3 10	... 1022			
" 6 ...	3	... 1030			
" 7 ...	3 10	... 1032			
" 8 ...	3	... 1031			
" 9 ...	4	... 1032			
" 10 ...	4 10	... 1026			
" 11 ...	5	... 1025			
" 12 ...	4 10	... 1024	} Morph. Hyd. gr. j, ter die		
" 14 ...	4	... 1029			
" 15 ...	4	... 1026			
" 16 ...	4 10	... 1026			
" 17 ...	4 10	... 1024			
" 18 ...	4 10	... 1021			

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.	Quantity of sugar per 24 hours.	Medicine.	Diet.
	p℥s. oz.	Sp. gr.	grains.	grains.		
Sep. 19	... 4	... 1020	Urine saccharine, but quantity of sugar not determined		Morph. Hydr. gr. j½, ter die	Restricted diet
" 20	... 3 10	... 1020				
" 21	... 4 10	... 1016				
" 22	... 4	... 1020				
" 23	... 4	... 1015			Morph. Hydr. gr. jss, ter die	
" 24	... 3 15	... 1016				
" 25	... 4 10	... 1020				
" 26	... 4	... 1019				
" 27	... 3 10	... 1021			Morph. Hydr. gr. j½, ter die. Mist. Hæmatoxyli co. 3j, ter die	
" 28	... 4	... 1020				
" 29	... 3 10	... 1020				
" 30	... 3 10	... 1019				
Oct. 1	... 4	... 1017	No sugar Do. Slight sugar Urine saccharine, but quantity of sugar not determined Trace of sugar Slight sugar Do. Do. Do.		Morph. Hydr. gr. ij, ter die. Mist. Hæmatoxyli co. 3j, ter die	Restricted diet, with half pint of milk.
" 2	... 3 10	... 1015				
" 4	... 3	... 1018				
" 5	... 3 10	... 1016				
" 6	... 3 10	... 1017			Morph. Hydr. gr. ij½, ter die	
" 7	... 3 15	... 1012				
" 8	... 5	... 1011				
" 9	... 4	... 1015				
" 10	... 3 10	... 1010			Morph. Hydr. gr. ijss, ter die	
" 11	... 4 10	... 1019				
" 12	... 4	... 1019				
" 13	... 3	... 1025				
" 14	... 3 10	... 1020			Morph. Hydr. gr. ijss, ter die	
" 15	... 3 10	... 1020				
" 16	... 4	... 1018				
" 17	... 2 5	... 1019			Morph. Hydr. gr. ij½, ter die	
" 18	... 3 5	... 1022				
" 19	... 4	... 1019				
" 20	... 3 5	... 1020				
" 21	... 4	... 1020				

Morphia thus produced in this case a marked effect upon the urine. Under the influence of the alkaline mixture and restricted diet, the urine was brought down to a certain point in quantity and sp. gr. The administration of morphia reduced it in a marked manner still further, and upon several occasions an absence or only the presence of a trace or slight amount of sugar was encountered. The patient gained about half a stone in weight whilst he was in the hospital. No constipation was produced by the morphia; indeed there was throughout a tendency to diarrhœa, and at one time the treatment had to be wholly directed to the control of this state. An irritable state, in fact, of the whole alimentary canal existed, and there was often a fastidious appetite complained of. Beyond this nothing unfavorable was noticed, and the patient expressed himself as feeling much stronger and better in health. He left the hospital at the time he did in consequence of some dispute with one of the inmates of the ward.

CASE 4.—Treated with nepenthe, extract of opium, morphia, and codeine.

Robert R—, æt. 58, admitted into John Ward, under Dr. Pavy, April 9th, 1869. According to the report of Mr. Harris, the clinical clerk to the case, this patient has been by occupation an engine-driver. Seventeen years back he had an attack of gout, and has since had several other attacks. About four years ago, after an attack of gout and lumbago, he began to feel very thirsty. His thirst continued, and he then noticed that he was passing an excessive quantity of urine. He now attended as an out-patient at King's College Hospital, and afterwards as an out-patient at Guy's Hospital, under Dr. Pavy. Has at times passed as much as sixteen pints of urine a day. The quantity he has latterly been passing, whilst attending as an out-patient, and carrying out as well as he could at home a restricted diet, has been from about four to eight pints a day. The day before admission the quantity passed was seven and a half pints. Complains of slight dimness of sight. Lungs and other visceral organs healthy.

April 10th.—Ordered to take 15 grs. of the bicarb. of potash, ʒss of the ar. sp. of am., ex aquâ cinnamomi, ter quotidie, and to keep to a restricted diet, composed as follows:—12 oz. of cooked meat, 6 oz. almond biscuits, greens, 2 eggs, 2 pints of beef tea, 4 oz. of brandy. Subjoined is the daily report of his case whilst an inmate of the hospital.

Date.	Quantity of urine per 24 hours.			Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.	
	pts.	oz.	Sp. gr.	grains.	grains.				
Apr. 12	...	4 1	...	1038	...	27·69	...	2241	Pot. Bicarb. gr. xv, Sp. Ammon. Ar. ʒss, Aq. Cinnam. ʒj, ter quotidie
„ 13	...	4 15	...	1035	...	19·98	...	1898	
„ 14	...	4	...	1025	...	15·30	...	1224	
„ 15	...	3 6	...	1028	...	14·67	...	968	
„ 16	...	4 2	...	1025	...	9·33	...	765	Nepenthe mxx ex Aq. Menthae, 6tis horis
„ 17	...	2 12	...	1021	...	7·74	...	402	
„ 18	...	2 11	...	1022	...	8·46	...	431	Nepenthe mxxv ex Aq. Menthae, 6tis horis
„ 19	...	2 17	...	1019	...	8·55	...	487	
„ 20	...	2 9	...	1016	...	3·69	...	180	
„ 21	...	2 18	...	1019	...	3·47	...	201	
„ 22	...	2 7	...	1020	...	Slight sugar	Nepenthe mxx ex Aq. Menthae, 6tis horis
„ 23	...	1 14	...	1021	...	No sugar	...	...
„ 24	...	1 11	...	1022	...	Do.	...	...
„ 25	...	2 10	...	1018	...	Do.	...	...
„ 26	...	2 15	...	1019	...	Slight sugar	Nepenthe mxxv ex Aq. Menthae, 6tis horis
„ 27	...	2 4	...	1020	...	No sugar	...	...
„ 28	...	2 11	...	1021	...	Do.	...	...
„ 29	...	2 12	...	1022	...	Do.	...	...
„ 30	...	2 14	...	1020	...	Do.	
May 1	...	3 4	...	1022	...	Do.	...	...

Date.	Quantity of urine per 24 hours.			Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	
	pts. oz.	Sp. gr.		grains.		grains.		
May 2	3	4	1020	No sugar			Nepenthe mxxxv ex Aq. Menthae, 6tis horis	Restr.
" 3	2	16	1021	Do.				
" 4	2	15	1019	Do.				
" 5	2	17	1021	Do.				
" 6	2	16	1022	Do.				
" 7	2	17	1021	Do.				
" 8	2	16	1020	Do.				
" 9	2	6	1021	Do.				
" 10	2	6	1020	Do.				
" 11	2	10	1020	Do.				
" 12	2	8	1022	Do.				
" 13	2	11	1020	Do.				
" 14	2	2	1021	6.85		287	Nepenthe mxxx ex Aq. Menthae, 6tis horis	Res diet, additi oz. of
" 15	2	8	1025	5		240		
" 16	2	11	1022	No sugar				
" 17	2	10	1021	Do.				
" 18	2	4	1022	Slight sugar				
" 19	2	2	1022	Do.				
" 20	2	9	1020	3.69		180		
" 21	2	17	1020	4.36		248		
" 22	2	13	1019	No sugar				
" 23	2	17	1020	Do.				
" 24	2	16	1020	Do.				
" 25	2	6	1021	Do.				
" 26	2	2	1023	Do.				
" 27	2	8	1021	Do.				
" 28	2	12	1021	Do.				
" 29	2	12	1023	Do.				
" 30	3		1020	5.58		334	Nepenthe mxi ex Aq. Menthae, 6tis horis	Rest diet, w additio oz. of
" 31	1	16	1021	No sugar				
June 1	2	10	1024	Do.				
" 2	3		1022	6.15		369		
" 3	2	18	1026	12.84		744		
" 4	2	16	1028	11.07		619		
" 5	2	2	1022	Slight sugar				
" 6	2	8	1020	No sugar				
" 7	2	10	1022	Do.				
" 8	2	2	1022	Do.				
" 9	2	4	1023	Do.				
" 10	2	12	1022	Do.				
" 11	3		1020	Do.			Nepenthe m ex Aq. Menthae, 6tis horis	Rest diet, w additio oz. of
" 12	3	8	1018	Do.				
" 13	2	6	1023	Slight sugar				
" 14	2	4	1023	No sugar				
" 15	2	14	1020	2.96		159		
" 16	3		1021	3.15		189		

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.			
June 17 ...	2 15	...	1021	...	Slight sugar	...	
" 18 ...	2 18	...	1020	...	5·33	...	309
" 19 ...	2 18	...	1020	...	No sugar	...	
" 20 ...	2 16	...	1019	...	Do.	...	
" 21 ...	2 7	...	1023	...	Do.	...	
" 22 ...	2 16	...	1022	...	Do.	...	
" 23 ...	2 14	...	1022	...	Do.	...	
" 24 ...	1 17	...	1025	...	Slight sugar	...	
" 25 ...	1 6	...	1027	...	3·93	...	102
" 26 ...	2 2	...	1024	...	5·21	...	218
" 27 ...	2	...	1021	...	Slight sugar	...	
" 28 ...	2 10	...	1022	...	No sugar	...	
" 29 ...	2 6	...	1023	...	5·71	...	262
" 30 ...	2	...	1020	...	Slight sugar	...	
July 1 ...	2	...	1026	...	6·80	...	272
" 2 ...	3	...	1023	...	5·45	...	327
" 3 ...	2 14	...	1029	...	6·85	...	369
" 4 ...	2 16	...	1030	...	8·88	...	497
" 5 ...	2	...	1028	...	10·90	...	428
" 6 ...	2 2	...	1030	...	8·	...	336
" 7 ...	2	...	1033	...	15·	...	600
" 8 ...	3 10	...	1030	...	19·98	...	1398
" 9 ...	2 16	...	1034	...	21·15	...	1184
" 10 ...	3 2	...	1031	...	18·98	...	1176
" 11 ...	2 12	...	1032	...	15·63	...	812
" 12 ...	2	...	1034	...	18·	...	720
" 13 ...	2 4	...	1037	...	18·	...	792
" 14 ...	2 10	...	1031	...	20·55	...	1027
" 15 ...	2 2	...	1032	...	11·61	...	487
" 16 ...	2 7	...	1027	...	13·08	...	614
" 17 ...	2 2	...	1027	...	10·41	...	437
" 18 ...	1 12	...	1029	...	7·98	...	255
" 19 ...	1 18	...	1028	...	11·61	...	441
" 20 ...	2 2	...	1021	...	7·56	...	317
" 21 ...	2 4	...	1020	...	7·26	...	319
" 22 ...	2	...	1030	...	16·35	...	654
" 23 ...	1 17	...	1028	...	12·	...	444
" 24 ...	2	...	1032	...	12·63	...	505
" 25 ...	3	...	1031	...	15·63	...	937
" 26 ...	2 16	...	1032	...	18·	...	1008
" 27 ...	3 8	...	1034	...	22·50	...	1530
" 28 ...	3 4	...	1026	...	9·21	...	589

Nepenthe mlv ex
Aq. Menthæ,
6tis horis

Extr. Opii gr. ij,
ter die

Extr. Opii gr. ijss,
ter die

Extr. Opii gr. iij,
Extr. Aloes gr. ij,
ter die

Extr. Opii gr. iij,
Extr. Aloes gr. j,
ter die

Extr. Opii, gr. ijss,
ter die

Extr. Opii gr. iv,
ter die

Morph. Acet. gr. ij,
ter die

Morph. Acet. gr. ij½,
ter die

Morph. Acet. gr. ijss,
ter die

Morph. Acet. gr. ijss,
t. d., Pot. Bicarb.
gr. x, Sp. Am. Ar.
3ss, Tr. Lav. co.
mxx, Inf. Gent.
co. 3j, ter die

Restricted
diet, with the
addition of 4
oz. of bread.

Date	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine
	pts. oz.	Sp. gr.	grains		grains	
July 29 ...	2	...	1020	...	7.20	288
" 30 ...	1 18	...	1022	...	2.40	91
" 31 ...	2 6	...	1023	...	Slight sugar	...
Aug. 1 ...	2 16	...	1018	...	No sugar	...
" 2 ...	2 14	...	1020	...	Slight sugar	...
" 3 ...	2 15	...	1020	...	2.40	132
" 4 ...	2 9	...	1020	...	2.47	121
" 5 ...	1 18	...	1024	...	No sugar	...
" 6 ...	1 18	...	1023	...	Trace of sugar	...
" 7 ...	1 18	...	1023	...	Slight sugar	...
" 8 ...	2 8	...	1022	...	Do.	...
" 9 ...	1 16	...	1023	...	Trace of sugar	...
" 10 ...	2 8	...	1022	...	Slight sugar	...
" 11 ...	2 10	...	1022	...	Trace of sugar	...
" 12 ...	2	...	1023	...	Slight sugar	...
" 13 ...	1 16	...	1026	...	4.80	172
" 14 ...	2 2	...	1025	...	7.50	315
" 15 ...	2 5	...	1025	...	3.80	171
" 16 ...	2 2	...	1029	...	9.60	403
" 17 ...	2 18	...	1029	...	10.90	632
" 18 ...	2 2	...	1028	...	9.21	386
" 19 ...	1 6	...	1032	...	11.79	306
" 20 ...	2	...	1026	...	7.32	292
" 21 ...	2 11	...	1027	...	9.60	489

Codeinæ gr. iij, ter
die. Rep. Mist. ad
oz.

Codeinæ gr. iv, ter
die. Rep. Mist.

Remarks.—The medicine, after the alkaline mixture, which was administered for the first few days, commenced with here was the opiate preparation the name of nepenthe. This was conjoined with a restricted diet, and the exceedingly satisfactory. The urine fell to a natural amount, and became sugar. After this state had existed for some time 2 oz. of bread were allowed. This producing no alteration in the condition of the urine, the quantity of increased to 4 oz. The urine now, upon some occasions, was found to to a small extent with sugar. Subsequently, however, the sugar disappeared. This further increase, viz. to 6 oz., was made in the quantity of bread. Und sugar reappeared, and rose to 744 grains for the day. The bread was reduced back to 4 oz., and the urine became again free from sugar, and so for a little while. Afterwards its condition fluctuated, and the extract of opium was tried, beginning with a 2-grain dose three times a day. The dose of opium had been previously given was 55 minims four times daily. The report under the extr. of opium, from whatever cause it arose, the urine was nearly so satisfactory a condition as before. Morphia was next administered, however, the production of any marked result. This was followed under which at first there was an excellent effect; afterwards the urine presented evidence of being charged with a small amount of sugar. The patient feeling perfectly well in himself, and anxious to return home. Under the

he was discharged from the hospital, and allowed to have medicine ending as an out-patient. He has been taking codeine, and when I last in the account he gave was that he was living upon an ordinary diet, from three to three and a half pints of urine in the twenty-four hours, suffering from none of the symptoms of inconvenience which he had formerly experienced.

5.—*Treated with morphia, opium, narceine, and codeine.*

ert J—, æt. 29, admitted into Guy's Hospital under my care, November 18th, Has been occupied as an insurance agent, and living without any fixed abode. He is a dark-complexioned man, of middle stature, and inclines to eas of body, but without presenting an actually emaciated appearance. to suffer from diabetes about nine months back, and rapidly grew thinner and after being seized with his complaint. He became an inmate of the dge Wells Infirmary, where his condition improved. Grew worse again on his ge, and, continuing to get worse, he subsequently sought admission into Guy's al, and was placed under my charge. His case was found to be one of ry diabetes mellitus, without any other complaint. For the first few days admission he was placed upon a mixed diet, and the subjoined report shows antities of urine and sugar that were passed. He was then ordered a restricted nd, besides other medicinal agents, the ozonic ether was for a time administered. not until after he had been in the hospital for about six weeks that morphia rdered, and hence in the report the introduction of the account of the etween November 23rd and January 9th has been considered unnecessary.

Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.		Medicine.	Diet.
pts. oz.	Sp. gr.	grains.	grains.				
...10	...	1036	...	36	...	Pot. Bicarb. gr. xv,	Ordinary mixed diet.
...13 10	...	1033	...	45	...	Sp. Am. Ar. mxx,	
...13	...	1038	...	45	...	Tr. Lav. co. mxx, ex Aq., ter die	
... 5 15	...	1035	...	26.75	...	3076	Morph. Hyd. gr. ½, ter die
... 5 10	...	1042	...	28.75	...	3162	
... 5	...	1038	...	27.50	...	2750	
... 5	...	1039	...	22.50	...	2250	Morph. Hyd. gr. ½, ter die
... 4 15	...	1034	...	27.50	...	2612	
... 4 10	...	1037	...	23.25	...	2092	
... 4 10	...	1037	...	26.50	...	2385	Morph. Hyd. gr. ¾, ter die
... 4	...	1035	...	19.50	...	1560	
... 4	...	1039	...	19.50	...	1560	
... 3 10	...	1042	...	21.75	...	1522	Morph. Hyd. gr. ¾, ter die
... 3	...	1039	...	17.13	...	1020	
... 3	...	1035	...	18	...	1080	
... 3 5	...	1040	...	25.75	...	1673	Morph. Hyd. gr. j, ter die
... 3	...	1040	...	19	...	1140	
... 2 15	...	1032	...	5.75	...	316	
... 3	...	1038	...	13.25	...	795	Morph. Hyd. gr. j, ter die
... 3	...	1036	...	19	...	1140	

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.
	pta. oz.	Sp. gr.	grains.	grains.		
Jan. 26	... 3 5	... 1034	... 3-25	... 211	} Morph. Hyd. gr. 1½. ter die	
" 27	... 3	... 1035	... 2-50	... 150		
" 28	... 3 10	... 1040	... 23-25	... 1627		
" 29	... 1	... 1037	... 16	... 320		
" 30	... 1 10	... 1034	... 2-50	... 75		
" 31	... 1 10	... 1040	... 12	... 360	} Morph. Hyd. gr. 1½. ter die	
Feb. 1	... 1 10	... 1037	... 3-50	... 105		
" 2	... 1 15	... 1039	... 4	... 140		
" 3	... 1 10	... 1035	... Slight sugar	...		
" 4	... 1 10	... 1037	... 12-50	... 375		
" 5	... 2	... 1035	... 12	... 480		
" 6	... 1 10	... 1033	... No sugar	...		
" 7	... 1 10	... 1036	... Do.	...		
" 8	... 1 15	... 1035	... Do.	...		
" 9	... 1 15	... 1031	... Do.	...		
" 10	... 2	... 1033	... Do.	...		
" 11	... 2 4	... 1030	... Do.	...		
" 12	... 2	... 1031	... Do.	...		
" 13	... 1 15	... 1032	... Do.	...		
" 14	... 1 15	... 1030	... Do.	...		
" 15	... 1 10	...	... Do.	...		
" 16	... 1 10	... 1035	... 4-75	... 142	} Morph. Hyd. gr. 1½. ter die	
" 17	... 1 10	... 1035	... No sugar	...		
" 18	... 2	... 1030	... Do.	...		
" 19	... 1 10	... 1027	... Do.	...		
" 20	... 2	... 1029	... Do.	...		
" 23	... 1 15	... 1023	... Do.	...		
" 24	... 1 10	... 1030	... Do.	...		
" 25	... 1 10	... 1032	... Do.	...		
" 26	... 1 10	... 1029	... Do.	...		
" 27	... 1 6	... 1026	... Do.	...		
" 28	...	... 1031	... Do.	...		
Mar. 1	... 1 10	... 1025	... Do.	...	} Nil	
" 2	... 1 12	... 1030	... Do.	...		
" 3	... 1 10	... 1029	... Do.	...		
" 4	... 1 10	... 1030	... Do.	...		
" 5	...	... 1032	... Do.	...		
" 6	...	... 1033	... Do.	...		
" 7	... 1 10	... 1034	... Do.	...		
" 8	... 1 12	... 1032	... Do.	...		
" 9	... 1 10	... 1035	... Trace of sugar	...		
" 10	... 1 13	... 1036	... No sugar	...		
" 11	... 1 10	... 1038	... Trace of sugar	...		
" 12	... 1 15	... 1041	... 18	... 630		
" 13	... 1 10	... 1040	... 12	... 360		
" 14	... 1 16	... 1048	... 22-50	... 810		

Tr. Kino 3j ex
Liq. Calcis 3j,
6tis horis

Pulv. Opii gr. ss,
ter die

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.			
Mar. 15	2	8	1043	21.75	1044	Pulv. Opii gr. ss,	
" 16	2	6	1045	25.75	1184	ter die	
" 17	2	10	1047	27.50	1375	Pulv. Opii gr. $\frac{1}{2}$,	
" 18	2	15	1042	24.75	1361	ter die	
" 19	2	10	1045	28.75	1437	Pulv. Opii gr. j,	
" 20	2	18	1044	28.75	1667	ter die	
" 21	2	15	1032	27.50	1512	Pulv. Opii gr. jss,	
" 22	2	17	1038	16.	912	ter die	
" 23	2	6	1041	24.	1104		
" 24	2	15	1038	19.50	1072		
" 25	3	10	1040	26.50	1855	Pulv. Opii gr. ij,	
" 26	3	15	1033	24.75	1856	ter die	
" 27	3		1040	30.	1800		
" 28	2	10	1041	26.50	1325	Pulv. Opii gr. ijsa,	
" 29	2	15	1045	24.	1320	ter die	
" 30	2	5	1040	22.50	1012		
" 31	2		1040	19.	760	Pulv. Opii gr. iij,	
April 1	2	3	1037	14.50	623	ter die	
" 2	2	5	1040	15.50	697	Pulv. Opii gr. iijss,	
" 3	2	7	1038	11.50	540	ter die	
" 4	2	0	1040	17.50	700		
" 5	1	15	1037	10.50	367	Pulv. Opii, gr. iv,	
" 6	1	13	1037	10.50	346	ter die	
" 7	1	16	1038	16.25	585		
" 8	1	12	1040	16.75	536		
" 9	2		1032	Slight sugar			
" 10	1	15	1031	Do.			
" 11	1	10	1035	No sugar			
" 12	1	6	1033	Do.			
" 13	1	6	1033	Do.			
" 14	1	8	1033	Do.			
" 15	1	5	1034	Trace of sugar		Pulv. Opii gr. ivss,	
" 16	1	10	1034	No sugar		ter die	
" 17	1	8	1035	Do.			
" 18	1	6	1037	Do.			
" 19	1	8	1036	Do.			
" 20	1	10	1036	Slight sugar			
" 21	1	10	1034	No sugar			
" 22	1	12	1037	Do.			
" 23	1	10	1035	Do.		Pulv. Opii gr. v,	
" 24	1	8	1030	Do.		ter die	
" 25	1	13	1032	Do.			
" 26	1	13	1032	Do.		Pulv. Opii gr. vss,	
" 27	1	13	1033	Do.		ter die	
" 28	1	8	1035	Do.			

Restricted
diet.

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.			
Apr. 29	... 1 10	No sugar	...	Pulv. Opii gr. vj, ter die	Restrict ed diet.
" 30	... 1 8	...	1034	Do.	...		
May 1	... 1 8	...	1034	Do.	...		
" 2	... 1 12	...	1035	Do.	...		
" 3	... 2	...	1033	Do.	...		
" 4	... 1 12	...	1035	Do.	...	Pulv. Opii gr. vjss, ter die	Restrict ed diet, with bread
" 5	... 1 10	...	1029	Do.	...		
" 6	... 1 8	...	1032	Do.	...		
" 7	... 1 8	...	1030	Do.	...		
" 8	... 1 6	...	1029	Do.	...		
" 9	... 1 10	...	1031	Do.	...	Pulv. Opii gr. vij, ter die	Restrict ed diet, with bread
" 10	... 1 5	...	1031	Do.	...		
" 11	... 1 5	...	1032	Do.	...		
" 12	... 1 15	...	1030	Do.	...		
" 13	... 2	...	1031	Do.	...		
" 14	... 1 10	...	1032	Do.	...	Pulv. Opii gr. vijss, ter die	Restrict ed diet, with bread
" 15	... 1 11	...	1031	Do.	...		
" 16	... 1 12	...	1031	Do.	...		
" 17	... 1 18	...	1030	Do.	...		
" 18	... 1 19	...	1032	Do.	...		
" 19	... 1 11	...	1030	Do.	...	Pulv. Opii gr. vijss, ter die	Restrict ed diet, with bread
" 20	... 1 12	...	1027	Do.	...		
" 21	... 1 14	...	1030	Do.	...		
" 22	... 1 13	...	1030	Do.	...		
" 23	... 1 12	...	1031	Do.	...		
" 24	... 1 8	...	1032	Do.	...	Pulv. Opii gr. viij, ter die	Restrict ed diet, with bread
" 25	... 1 10	...	1030	Do.	...		
" 26	... 1 9	...	1032	Do.	...		
" 27	... 1 10	...	1032	Do.	...		
" 28	... 1 8	...	1035	Do.	...		
" 29	... 1 10	...	1035	Do.	...	Pulv. Opii gr. viij, ter die	Restrict ed diet, with bread
" 30	... 1 5	...	1035	Slight sugar	...		
" 31	... 1 14	...	1033	7·27	247		
June 1	... 1 6	...	1035	14·11	366		
" 2	... 1 15	...	1033	15·30	535		
" 3	... 2 4	...	1034	19·98	879	Pulv. Opii gr. viijss, ter die	Restricted diet, with 4 oz. of bread.
" 4	... 2 6	...	1036	Slight sugar	...		
" 5	... 1 8	...	1032	5·21	145		
" 6	... 1 10	...	1037	No sugar	...		
" 7	... 1 8	...	1034	Do.	...		
" 8	... 1 5	...	1032	Slight sugar	...	Pulv. Opii gr. ix, ter die	Restricted diet, with 4 oz. of bread.
" 9	... 1 3	...	1034	4·70	108		
" 10	... 1 4	...	1032	No sugar	...		
" 11	... 1 4	...	1028	Slight sugar	...		
" 12	... 1 5	...	1031	No sugar	...		

ity of per sura.	Quantity of sugar per fluid ounce.	Quantity of sugar per 24 hours.	Medicine.	Diet.
oz.	Sp. gr.	grains.	grains.	
11 ...	1030 ...	No sugar	...	Restricted diet, with 4 oz. of bread.
16 ...	1031 ...	Do.	...	
11 ...	1033 ...	6·31	195	
4 ...	1031 ...	Slight sugar	...	
13 ...	1031 ...	6·48	213	
7 ...	1032 ...	8·57	231	
	1035 ...	14·67	293	
4 ...	1037 ...	11·79	282	
15 ...	1039 ...	21·81	763	
	1029 ...	21·15	846	
3 ...	1043 ...	26·64	1145	Restricted diet.
8 ...	1042 ...	39·99	1919	
9 ...	1041 ...	30·	2070	
15 ...	1044 ...	30·	2250	
2 ...	1043 ...	32·70	2027	
2 ...	1042 ...	39·99	3279	
18 ...	1041 ...	30·	2340	
	1037 ...	24·81	1984	
10 ...	1038 ...	28·80	2592	
5 ...	1037 ...	22·24	1890	
10 ...	1033 ...	20·55	1438	Restricted diet.
14 ...	1033 ...	28·80	2131	
12 ...	1032 ...	18·45	1328	
15 ...	1030 ...	14·07	1055	
15 ...	1029 ...	14·67	1100	
2 ...	1030 ...	14·40	1180	
3 ...	1031 ...	19·98	1658	
15 ...	1030 ...	18·45	1752	
10 ...	1030 ...	21·15	1903	
2 ...	1030 ...	16·74	1372	
10 ...	1029 ...	18·45	1660	Restricted diet.
3 ...	1031 ...	19·98	1658	
	1029 ...	12·63	1010	
	1030 ...	16·35	1308	
18 ...	1030 ...	14·40	1123	
10 ...	1028 ...	18·	1260	
	1034 ...	19·98	1198	
16 ...	1032 ...	13·32	740	
13 ...	1035 ...	19·44	1030	
18 ...	1034 ...	18·45	1070	
15 ...	1036 ...	22·50	1237	Restricted diet.
14 ...	1026 ...	11·25	607	
14 ...	1036 ...	15·	510	

Cases of Diabetes treated by Opium

Date.	Quantity of urine per 24 hours		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.
	pts. or	Sp. gr	grains.	grains.		
July 31	... 2 10	... 1041	... 15.30	... 765	Codeinæ gr. iij, ter die. Rep. Mist.	
Aug. 1	... 2	... 1045	... 16.74	... 669		
" 2	... 2	... 1040	... 14.10	... 564		
" 3	... 2 4	... 1042	... 17.13	... 753		
" 4	... 2 3	... 1039	... 9.72	... 417		
" 5	... 1 18	... 1044	... 23.22	... 882		
" 6	... 2 5	... 1042	... 25.71	... 1156		
" 7	... 2 1	... 1039	... 19.98	... 819		
" 8	... 2 5	... 1047	... 20.55	... 924		
" 9	... 1 18	... 1042	... 19.44	... 738		
" 10	... 2 7	... 1038	... 26.64	... 1252	Codeinæ gr. iv, ter die. Rep. Mist.	
" 11	... 2 7	... 1041	... 17.55	... 824		
" 12	... 2	... 1042	... 21.15	... 846		
" 13	... 2 5	... 1037	... 24.	... 1080		
" 14	... 2	... 1040	... 19.44	... 777		
" 15	... 2 8	... 1040	... 22.50	... 1080		
" 16	... 2 6	... 1041	... 22.50	... 1035		
" 17	... 2 12	... 1040	... 25.71	... 1336		
" 18	... 2 8	... 1040	... 20.55	... 986		
" 19	... 2 16	... 1039	... 24.	... 1344		
" 20	... 2 15	... 1035	... 22.50	... 1237	Codeinæ gr. v, ter die. Pot. Bicarb. gr. xx, Sp. Am. Ar. 3ss, Tr. Lav. co. mxxv, ex Inf. Aurantii co.	R
" 21	... 2 10	... 1036	... 18.93	... 946		
" 22	... 2 9	... 1037	... 21.81	... 1068		
" 23	... 3	... 1036	... 18.93	... 1135		
" 24	... 2 15	... 1036	... 24.	... 1320	Codeinæ gr. vj, ter die. Rep. Mist.	
" 25	... 2 8	... 1037	... 25.71	... 1234		
" 26	... 2 5	... 1037	... 17.13	... 770	Codeinæ gr. vj, ter die. Tr. Ferri Sesquichlo. mxxv ex Inf. Quassia, ter die	
" 27	... 2 6	... 1038	... 20.55	... 945		
" 28	... 2 5	... 1039	... 18.91	... 850		
" 29	... 2 6	... 1030	... 18.	... 828		
" 30	... 2	... 1029	... 15.	... 600		
" 31	... 1 14	... 1035	... 17.55	... 596		
Sept. 1	... 1 18	... 1036	... 30.	... 1140	Codeinæ gr. vj, Ext. Aloes gr. jss, ter die. Rep. Mist.	
" 2	... 2 2	... 1034	... 23.22	... 975		
" 3	... 2 5	... 1036	... 24.81	... 1116		
" 4	... 2 5	... 1034	... 27.69	... 1246		
" 5	... 2 2	... 1035	... 27.69	... 1162		
" 6	... 2 5	... 1037	... 32.7	... 1471		
" 7	... 2	... 1038	... 27.69	... 1107		
" 8	... 1 18	... 1036	... 27.69	... 1052		
" 9	... 1 19	... 1038	... 30.	... 1170		
" 10	... 2	... 1040	... 34.26	... 1370		
" 11	... 2 2	... 1038	... 34.26	... 1438		
" 12	... 2 8	... 1037	... 19.98	... 959		
" 13	... 2 8	... 1041	... 25.71	... 1234		

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.		grains.		
Sept. 14	2 10	1041	37.89	1894			
„ 15	2 3	1045	27.69	1190		Codeinæ gr. vj,	
„ 16	2 5	1041	26.64	1198		Morph. Hyd. gr.	
„ 17	1 9	1043	25.71	745		‡, Extr. Aloes,	
„ 18	1 16	1046	24.	864		gr. jss, ter die.	
„ 19	2 3	1043	24.81	1066		Rep. Mist.	
„ 20	2 5	1041	24.	1080			
„ 21	2	1039	27.69	1107			
„ 22	2 2	1039	20.55	863			
„ 23	1 19	1040	27.69	1079		Codeinæ gr. vj,	
„ 24	1 18	1041	17.55	666		Morph. Hyd. gr.	
„ 25	1 15	1043	19.44	680		‡, Extr. Aloes	
„ 26	1 17	1043	36.	1332		gr. jss, ter die.	
„ 27	2 5	1041	26.64	1198		Rep. Mist.	
„ 28	2 8	1040	27.69	1329			
„ 29	2 3	1040	21.81	937			
„ 30	2 5	1042	24.81	1116			
Oct. 1	2 10	1040	25.71	1285		Codeinæ gr. vjss,	
„ 2	3	1041	27.69	1661		Morph. Hyd. gr.	
„ 3	2 15	1041	25.71	1414		‡, Extr. Aloes	
„ 4	2 15	1037	22.22	1222		gr. jss, ter die.	
„ 5	2	1036	19.98	799		Rep. Mist.	
„ 6	1 18	1037	27.69	1052		Pot. Bromidi gr.	
„ 7	2 16	1038	25.71	1439		xx ex Inf. Gent.	
„ 8	3	1036	24.81	1488		co., ter die	

Restricted
diet.

Remarks.—This case, during the early part of its course, affords a striking illustration of the effect producible by morphia and opium in controlling the elimination of sugar. The state of the urine at the time of admission and during the first few days, when the patient was upon a mixed diet, shows that the case represented a severe form of diabetes. Before the morphia treatment was commenced the patient had been some weeks in the hospital upon a restricted diet. The only change made was in the medicine administered, and therefore, any alteration in the state of the urine must be fairly referred to this. Previous to the administration of morphia the quantity of sugar had not been at any time lower 1800 grains for the twenty-four hours, and averaged, in fact, about 2500 to 3000 grains. Under gradually increasing doses of morphia, the sugar, as seen by the report, underwent, a gradual diminution, and in rather less than four weeks disappeared altogether. With this alteration as regards the sugar, the urine fell from upwards of five pints to a pint and a half and even, upon one occasion, a pint for the twenty-four hours.

The urine having been free from sugar for some time under the administration of the morphia, this agent was suddenly discontinued, and in the course of about a week the urine became again charged with sugar. Opium was now given in increasing doses, and again the sugar disappeared. After it had been absent for a while, the patient was allowed two ounces of ordinary bread with his

otherwise restricted diet *per diem*. No return of sugar being observed, the allowance was increased to four ounces and then to six. The four ounces could be appropriated to the requirements of the system, and none passed off under the form of sugar with the urine. With the six ounces, however, some sugar escaped, and the quantity of bread was reduced again to four ounces *per diem*. At first the sugar disappeared, but afterwards returned in small amount. As the patient now complained of headache, a feeling of sickness, and loss of appetite, the opium was ordered to be discontinued. The sugar immediately made rapid strides of ascent, and from this time it may be said the case took an unfavorable turn. Up to this period the patient had been improving in health and gaining flesh. At the end of April he had increased sixteen and a half pounds in weight since his admission into the hospital. Codeine and narcotine were afterwards administered, but the result was not what could be desired. The sugar was, evidently, to a considerable extent kept down, but the impression could not be made upon it that was done before. He seemed to have arrived at an immovable point, and as he had been so long a time in the hospital I spoke to him about his discharge. At the idea of this he was much depressed, having, as he said, no home to go to. On the Sunday afternoon, as he was to leave the next week, whilst walking on the colonnade, he had an epileptiform fit. He soon recovered from it, however, and the next day was in his usual state. No alteration was made in the directions about his leaving the hospital; he left, and, from information which the nurse subsequently received, it appears that he soon afterwards grew worse, and has since died.

CASE 6.—Treated with narcotine and codeine.

John D.—æt. 51. This patient formed the subject of Case 1, and when in the hospital before was treated with opium. After his discharge from the hospital at the beginning of August, 1868, he returned to his work, that of a carman, and has been able to follow it so as to gain his livelihood ever since. Finding that he was feeling weaker than usual, he applied at the beginning of September to be under my care as an out-patient. I took him again into the hospital, and this time he has been treated first with narcotine and then with codeine. The subjoined daily report shows the result. In appearance the patient looks about the same as when he was under my care a year ago.

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.		Medicine.	Diet.	
	pts. oz.	Sp. gr.	grains.	grains.					
Sept. 12	... 5 14	... 1016	... 7.20	... 820	} Tinct. Nucis Vom. " x, Aq. Camp. ʒj, ter die				Restricted diet.
" 13	... 4 8	... 1024	... 9.23	... 812					
" 14	... 3 14	... 1026	... 10.14	... 750					
" 15	... 3 14	... 1027	... 15	... 1110					
" 16	... 3 16	... 1031	... 18.93	... 1438					
" 17	... 4	... 1032	... 15.30	... 1224	} Narcotinæ gr. ss, ter die. Rep. Mist.				
" 18	... 4 6	... 1026	... 16.35	... 1406					
" 19	... 4	... 1032	... 18.93	... 1514					
" 20	... 4	... 1029	... 17.13	... 1370					
" 21	... 4 2	... 1033	... 17.13	... 1404					
" 22	... 4 4	... 1033	... 18.93	... 1590	} Narcotinæ gr j, ter die. Rep. Mist.				

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.			
Sept. 23	... 4 16	... 1034	... 18-39	... 1765	Narcotinæ gr. 1½, ter die. Rep. Mist.	Restricted diet.	
" 24	... 5	... 1034	... 16-35	... 1635			
" 25	... 4 6	... 1035	... 14-67	... 1261			
" 26	... 5	... 1032	... 16-74	... 1674			
" 27	... 5 2	... 1034	... 18	... 1836			
" 28	... 5	... 1034	... 12-39	... 1239	Narcotinæ gr. jss, ter die. Rep. Mist.		
" 29	... 4 18	... 1032	... 17-11	... 1676			
" 30	... 5	... 1035	... 21-15	... 2115			
Oct. 1	... 5 2	... 1032	... 16-35	... 1667	Narcotinæ gr. 1½, ter die. Rep. Mist.		
" 2	... 5 4	... 1033	... 18	... 1872			
" 3	... 4 10	... 1033	... 18-39	... 1655			
" 4	... 3 16	... 1035	... 15	... 1140	Narcotinæ gr. ij, ter die. Rep. Mist.		
" 5	... 5	... 1031	... 15-63	... 1563			
" 6	... 5 2	... 1031	... 15-30	... 1560			
" 7	... 10	... 1032	... 15	... 3000			
" 8	... 5	... 1032	... 13-56	... 1356			
" 9	... 3 10	... 1025	... 16-74	... 1171	Narcotinæ gr. ijs ter die. Rep. Mist.		
" 10	... 4	... 1030	... 26-64	... 2131			
" 11	... 4 4	... 1031	... 24-81	... 2083			
" 12	... 4 4	... 1028	... 11-60	... 974			
" 13	... 4	... 1030	... 24-81	... 1984			
" 14	... 5	... 1030	... 15-99	... 1599	Narcotinæ gr. iij ter die. Rep. Mist.		
" 15	... 5	... 1030	... 14-40	... 1440			
" 16	... 5	... 1028	... 13-56	... 1356			
" 17	... 4 10	... 1031	... 14-60	... 1314			
" 18	... 4 11	... 1031	... 15-99	... 1503	Narcotinæ gr. iijss, ter die. Rep. Mist.		
" 19	... 4 18	... 1030	... 9-56	... 936			
" 20	... 4 4	... 1030	... 16-74	... 1406			
" 21	... 4 12	... 1030	... 12-39	... 1137			
" 22	... 4 16	... 1032	... 14-60	... 1401	Narcotinæ gr. iv, ter die. Rep. Mist.		
" 23	... 5	... 1031	... 19-44	... 1944			
" 24	... 4 16	... 1030	... 17-11	... 1642			
" 25	... 4 18	... 1032	... 15-99	... 1567			
" 26	... 4 16	... 1030	... 17-11	... 1642	Narcotinæ gr. v, ter die. Rep. Mist.		
" 27	... 4 10	... 1031	... 19-44	... 1749			
" 28	... 4 10	... 1029	... 17-11	... 1539			
" 29	... 4 12	... 1032	... 15-63	... 1437			
" 30	... 5	... 1030	... 21-15	... 2115			
" 31	... 4 4	... 1032	... 20-55	... 1726	Codeinæ gr. ij, ter die		
Nov. 1	... 3	... 1037	... 25-71	... 1542			
" 2	... 2 14	... 1035	... 18-39	... 992			
" 3	... 2 14	... 1030	... 17-11	... 923			
" 4	... 2 18	... 1032	... 13-08	... 1148			
" 5	... 2 14	... 1027	... 13-56	... 732			
" 6	... 3 16	... 1023	... 19-44	... 1454			

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.			
Nov. 7	3	10	1030	13.81	966	Codeinæ gr. iij, ter die	
" 8	3	2	1031	12.84	796		
" 9	3		1030	14.67	880		
" 10	3	4	1023	9.60	614		
" 11	?		1032	13.08	...	Codeinæ gr. iv, ter die	
" 12	3	8	1028	15.	1020		
" 13	3	16	1022	7.20	547		
" 14	3	4	1022	5.45	348		
" 15	3	2	1020	4.36	270	Codeinæ gr. v, ter die	
" 16	2		1030	9.	360		
" 17	2	8	1025	3.52	168		
" 18	3	6	1018	2.72	179		
" 19	2	8	1022	Trace of sugar	...	Codeinæ gr. v, ter die. Acidi Hy- drocyan.dil. miiij, Tinc. Calumbæ 3j, ex Mist. Efferv. ter die.	
" 20	3	4	1021	Do.	...		
" 21	2	12	1024	No sugar	...		
" 22	3	6	1025	Trace of sugar	...		
" 23	2	16	1030	2.42	135	Codeinæ gr. vj, ter die. Rep. Mist.	Restrict- ed diet.
" 24	2	4	1027	Trace of sugar	...		
" 25	3	4	1023	Slight sugar	...		
" 26	3	8	1025	2.40	163		
" 27	2	4	1029	4.52	198	Codeinæ gr. vij, ter die. Rep. Mist.	
" 28	2	8	1036	8.57	411		
" 29	3		1031	8.27	496		
" 30	2	12	1030	6.48	336		
Dec. 1	2	2	1033	8.57	359	Codeinæ gr. viij, ter die. Rep. Mist.	
" 2	2	10	1027	4.13	206		
" 3	3	4	1026	4.80	307		
" 4	3	8	1023	3.75	255		
" 5	3		1027	Slight sugar	...	Codeinæ gr. ix, ter die. Rep. Mist.	
" 6	4		1019	Trace of sugar	...		
" 7	3	6	1018	Do.	...		
" 8	3		1025	2.40	144		
" 9	3	2	1021	Trace of sugar	...	Codeinæ gr. x, ter die. Rep. Mist.	
" 10	3		1020	No sugar	...		
" 11	2	4	1019	Do.	...		

This patient remains still under treatment in the hospital. As in Case 7, narcotine was administered and a restricted diet conjoined. The dose was increased until it reached five grains three times a day. I did not observe any decided effect of any kind produced. As regards the urine, it seemed to remain quite uninfluenced. Codeine was now administered instead, beginning with a dose of two grains three times a day, as the patient had been for some time previously taking narcotine.

at this dose, suddenly commenced, considerable drowsiness was complained of not sufficient to lead me to consider that any reduction was necessary. The dose has since been gradually increased, and no inconvenience of any sort complained of. It was not long, as may be seen by the details of the report to be found above, before codeine was thus commenced before a marked beneficial effect was observable in the urine. The patient latterly has been passing no sugar, and he expresses himself as feeling strong and well. The report is continued up to the latest date allowed for sending this communication to the printer.

CASE 7.—*Treated with narcotine and codeine.*

Edward W—, æt. 30, admitted into Philip Ward, Guy's Hospital, under Dr. Roberts's care, August 21st, 1869. The following history is taken from the notes of Dr. Roberts. The patient is by occupation a book-edge-marbler and has always worked very regularly. Never had a day's illness until December last, when he began to feel languid and indisposed for exertion, and at the same time noticed that he did not perspire as usual. He soon found that he became very thirsty, and that he was obliged to get out of bed at times during the night to pass water. His appetite also became excessive. He now sought advice at the Bedford Street Dispensary, where he was attended as a patient for nine weeks. At the end of this time noticed that his hands and ankles began to swell, and that he had got very weak. He next applied to St. Bartholomew's Hospital, and after attending for six weeks as an out-patient was admitted into the wards. He then, it was found, was passing 13½ pints of urine in the twenty-four hours. He was strictly dieted for eight weeks, and the quantity of urine, he says, fell to 8 and 9 pints. The swelling of his legs and ankles disappeared, and he continued to get weaker. Subsequently he attended as an out-patient at St. Bartholomew's Hospital under Dr. Pavy, and was afterwards admitted into Philip Ward under his care.

He is a fair-complexioned man. Face rather pale. Tongue large, moist, fissured and slightly coated. Weighs 9 st. 2lb., but about nine months back his weight was 11 st. 3 lb. Is very thirsty and has a good appetite without its being excessive.

Is passing about 6½ and 7 pints of urine in the twenty-four hours. Experiences general weakness when he tries to exert himself. His bowels act regularly. Heart and lungs healthy. Urine free from albumen, but highly charged with sugar. The daily report of the state of the urine and the treatment in this case runs as follows.

Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.		Medicine.	Diet.
pts. oz.	Sp. gr.	grains.	grains.	grains.	grains.		
4 12	1035	18·93	...	1741	...	Pot. Bicarb. gr. xv,	Restricted diet.
5	1033	15·	...	1500	...	Sp. Am. Ar 3ss,	
5 15	1030	17·13	...	1969	...	Inf. Calumb., t.d.	
5	1032	15·63	...	1563	...	Narcotinæ gr. ½,	
5 16	1030	13·83	...	1604	...	ter die. Rep.	
5 8	1029	16·35	...	1765	...	Mist.	

Date.	Quantity of urine per 24 hours.	Quantity of sugar per fluid ounce.	Quantity of sugar per 24 hours.	Medicine.	Diet.	
	pts. oz.	Sp. gr.	grains.	grains.		
Aug. 29 ...	5 6	Not examined	...	Narcotinæ, gr. ½, t. d. Rep. Mist.	Restricta diet.	
" 30 ...	3 6					
" 31 ...	2 14			Narcotinæ gr. ½, t. d. Pulv. Cretæ co. c. Opio gr. x, Sp. Am. Ar. ʒss, Tr. Lavand. co. xxx, Tr. Catechu ʒj, ex Aq. Camph., ter die.		
Sept. 1 ...	3 8					
" 2 ...	3 8					
" 3 ...	4 3					
" 4 ...	4 6					
" 5 ...	3 3					
" 6 ...	3 16	1030	16.74	1272		
" 7 ...	4	Not examined	...	Narcotinæ gr. ½, t. d. Rep. Mist.		
" 8 ...	4 10					
" 9 ...	4					
" 10 ...	4 12					
" 11 ...	4					
" 12 ...	4					
" 13 ...	3 10	1034	21.15	1480		Narcotinæ, gr. j, ter die. Mist. Quinæ, ter die.
" 14 ...	4 10	1021	17.13	1541		
" 15 ...	4 12	1031	16.74	1540		
" 16 ...	4	1035	18.93	1514		
" 17 ...	5 10	1039	24.	2640		Narcotinæ gr. 1½, t. d. Rep. Mist.
" 18 ...	4 6	1030	15.63	1344		
" 19 ...	4 10	1029	16.35	1471		
" 20 ...	5 4	1030	15.	1560		
" 21 ...	5 4	1030	12.63	1313		Narcotinæ gr. jss, t. d. Rep. Mist.
" 22 ...	5 6	1031	17.55	1860		
" 23 ...	5 6	1032	18.91	2004		Narcotinæ gr. 1½, t. d. Rep. Mist.
" 24 ...	5 4	1031	16.35	1700		
" 25 ...	5	1031	12.39	1239		
" 26 ...	5 2	1027	11.79	1202		
" 27 ...	5	1025	13.56	1356		Narcotinæ gr. ij, ter die. Rep. Mist.
" 28 ...	4 18	1027	11.74	1150		
" 29 ...	5 8	1027	17.11	1847		
" 30 ...	5 4	1027	14.10	1466		
Oct. 1 ...	4 16	1033	11.79	1131		Narcotinæ gr. ijss, ter die. Rep. Mist.
" 2 ...	5 2	1026	12.39	1263		
" 3 ...	5 14	1023	10.16	1158		Narcotinæ gr. iij, ter die. Rep. Mist.
" 4 ...	5	1029	15.	1500		
" 5 ...	5	1030	17.35	1735		
" 6 ...	4 6	1030	16.35	1406		
" 7 ...	5 10	1030	15.	1650		Narcotinæ gr. iijss ter die. Rep. Mist.
" 8 ...	5 10	1027	14.40	1584		
" 9 ...	5 4	1027	13.56	1410		
" 10 ...	5 4	1033	22.50	2340		
" 11 ...	5 6	1029	21.81	2311		Narcotinæ gr. iijss ter die. Rep. Mist.
" 12 ...	5 6	1027	13.08	1386		

e.	Quantity of urine per 24 hours.			Quantity of sugar per fluid ounce.			Quantity of sugar per 24 hours.			Medicine.	Diet.
	pts.	oz.	Sp. gr.	grains.	grains.	grains.					
13	...	5	6	...	1028	...	11-07	...	1173	Narcotinæ gr. iijss, ter die. Rep. Mist.	
14	...	5	8	...	1027	...	15-99	...	1726		
15	...	5	10	...	1027	...	16-74	...	1841		
16	...	5	10	...	1026	...	15-99	...	1758		
17	...	5	10	...	1025	...	14-57	...	1602	Narcotinæ gr. iv, t. d. Rep. Mist.	
18	...	5	10	...	1023	...	11-79	...	1296		
19	...	5	2	...	1026	...	13-83	...	1410		
20	...	5		...	1032	...	17-55	...	1755		
21	...	5	3	...	1028	...	13-81	...	1422	Narcotinæ gr. ivss, ter die. Rep. Mist.	
22	...	5	8	...	1029	...	14-57	...	1573		
23	...	5	1	...	1028	...	14-40	...	1454		
24	...	5	10	...	1030	...	18-39	...	2022		
25	...	5	14	...	1029	...	23-22	...	2647	Narcotinæ gr. v, t. d. Rep. Mist.	
26	...	3	12	...	1031	...	18-93	...	1362		
27	...	5	13	...	1032	...	17-55	...	1983		
28	...	6		...	1030	...	15-99	...	1918		
29	...	6		...	1030	...	13-81	...	1657	Codeinæ gr. j, t. d. Rep. Mist.	
30	...	6		...	1031	...	22-22	...	2666		
31	...	5	14	...	1035	...	9-56	...	1089		
1	...	6		...	1026	...	14-40	...	1728		
2	...	6		...	1026	...	14-10	...	1692	Codeinæ gr. ij, t. d., Rep. Mist.	
3	...	5	7	...	1027	...	13-81	...	1477		
4	...	6		...	1029	...	17-55	...	2106		
5	...	5	10	...	1028	...	14-40	...	1584	Codeinæ gr. iij, ter die. Pil. Aloes Soc. gr. v, omni nocte. Rep. Mist.	Restricted diet.
6	...	5	10	...	1028	...	14-57	...	1602		
7	...	4	16	...	1030	...	18-93	...	1817		
8	...	5	8	...	1029	...	17-11	...	1847		
9	...	5	4	...	1031	...	20-55	...	2137	Codeinæ gr. iv, Ext. Calumb. gr. ij, t. d. Rep. Pil. Aloes Soc. et Mist.	
10	...	6		...	—	...	19-98	...	2397		
11	...	?		...	1030	...	17-11	...	?		
12	...	4	13	...	1030	...	17-55	...	1632		
13	...	5	10	...	1031	...	28-80	...	3168	Codeinæ gr. v, Ext. Calumbæ gr. ij, t. d., Rep. Pil. Aloes Soc. et Mist.	
14	...	5	8	...	1030	...	19-44	...	2099		
15	...	5		...	1034	...	28-80	...	2880		
16	...	5	8	...	1032	...	18-	...	1944		
17	...	5	10	...	1030	...	19-44	...	2138	Codeinæ gr. vij, Ext. Calumbæ gr. iij, ter die. Rep. Mist.	
18	...	5	12	...	1031	...	20-44	...	2289		
19	...	5	8	...	1030	...	18-39	...	1986		
20	...	4	16	...	1031	...	18-39	...	1765		

Date.	Quantity of urine per 24 hours.		Quantity of sugar per total urine.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. ss.	grs.	pts. ss.	grs.	grains.		
Nov. 21	4	16	1032	13	44	1346	Codeine gr. viij.
" 22	5	1	1030	13	31	1349	Extr. Calumbæ
" 23	5	10	1031	13	39	2022	gr. iij. ter die.
							Rep. Mist.
" 24	3	16	1030	15	39	1215	
" 25	4	2	1031	13	39	1507	
" 26	4	16	?	?	?	?	Codeine gr. viij.
" 27	5	?	1030	17	11	1711	Extr. Calumbæ
" 28	4	16	1031	21	31	2093	gr. iij. ter die.
" 29	5	2	1032	19	30	2037	Rep. Mist.
" 30	4	18	1030	24	?	2352	
Dec. 1	5	10	1031	21	31	2399	Restrict—do
" 2	5	4	1032	20	55	2137	diet.
" 3	4	18	1032	21	15	2072	
" 4	5	10	1034	28	30	3163	Codeine gr. ix. Ext.
" 5	5	4	1031	18	39	1912	Calumbæ gr. iij.
" 6	5	5	1031	17	11	1711	ter die. Rep.
" 7	5	6	1032	15	39	1694	Mist.
" 8	5	?	1032	21	15	2115	
" 9	5	?	1033	18	?	1800	* Codeine gr. x.
" 10	5	6	1032	20	55	2178	Extr. Calumbæ
" 11	5	?	1032	14	40	1440	gr. iij. ter die.
							Rep. Mist.

* Vide what
stated below about
mistake in
dose of codeine
administered.

Remarks.—Case 7 was treated at the same time and in the same manner as Case 6. Both patients were put upon a restricted diet, and narcotine was administered, the dose in each case being raised to five grains three times a day. I could not perceive that any effect was produced either upon the urine or in any other way. The narcotine was then taken off and codeine given in its stead. Upon looking at the reports, it will now be seen that the two case present a contrast to each other. In Case 6, under the influence of the codeine the sugar was lessened and then disappeared. In Case 7, however, it does not appear that any impression has yet been made. I was mentioning on the last day to which the reports extend (December 11th) to my colleague, Dr. Rees, the contrast observable in these cases, thinking at the time in accordance with the reports, that both patients were taking the same dose. On going up afterwards to Case 7, the patient asked me if he might not have the same number of pills as the other patient, who was doing so well was taking. I then learnt, upon making inquiry, that a mistake had occurred in the ward in the administration of the medicine. This patient had never had more than one pill three times a day, whereas the codeine ordered had been made up first into one, then two, and, when the dose reached ten grains, three pills. With one pill, therefore, the patient would be taking very much less than was imagined and intended. It remains to be seen what effect a larger dose will produce upon the urine.

CASE 8.—*Treated with codeine.*

William A—, æt. 30, admitted under my charge into Philip Ward, Guy's Hospital, September 29th, 1869. This patient is a farrier by occupation, and, according to the report of Mr. Johnson, has always enjoyed good health until five months ago, when he experienced pain in his back and loins, and began to get weak, to suffer from thirst, and to pass an excessively large quantity of urine. About a fortnight back his ankles and feet became oedematous. He is a dark-complexioned man, has a pale face, a spare appearance, and a careworn look. The heart and lung sounds are normal. The urine gave a strong reaction upon being tested for sugar, but no reaction with the tests for albumen.

The following tabulated report shows the treatment and progress of this case.

Date.	Quantity of urine per ½ hours.			Quantity of sugar per fluid ounce.			Quantity of sugar per 24 hours.	Medicine.	Diet.
	pta. os.	Sp. gr.	grains.	grains.					
Oct. 1	...10 10	... 1033	... 24·81	... 5210	Aq. Camph. ʒj, ter die	Ordinary mixed diet.			
" 2	...18 8	... 1031	... 17·13	... 6303					
" 3	...16	... 1038	... 24·81	... 7939					
" 4	...16 2	... 1035	... 27·69	... 8916					
" 5	...15	... 1036	... 20·55	... 6165	Codeinæ gr. j, Pil. Aloes Soc. gr. ij, ter die				
" 6	...12	... 1037	... 24·	... 5760					
" 7	...10	... 1036	... 27·69	... 5538					
" 8	...10 8	... 1032	... 24·	... 4992					
" 9	...10 8	... 1034	... 28·80	... 5990					
" 10	...10	... 1030	... 36·	... 7200					
" 11	...13 6	... 1035	... 42·33	... 11,259	Codeinæ gr. ʒss, ter die				
" 12	...11	... 1031	... 22·22	... 4888					
" 13	...12	... 1032	... 21·81	... 5234					
" 14	...10	... 1033	... 31·29	... 6258					
" 15	...12 8	... 1037	... 25·71	... 6376	Codeinæ gr. ij, ter die				
" 16	...13	... 1033	... 20·55	... 5343					
" 17	...13	... 1036	... 31·29	... 8135					
" 18	...12 12	... 1032	... 22·50	... 5670	Codeinæ gr. ij, ter die				
" 19	...10 2	... 1040	... 31·29	... 6320					
" 20	...11 2	... 1032	... 20·55	... 4562					
" 21	...10 12	... 1034	... 26·71	... 5662	Codeinæ gr. iʒss, ter die				
" 22	...11	... 1033	... 22·50	... 4950					
" 23	...10 10	... 1032	... 48·	... 10,080					
" 24	...11	... 1034	... 37·89	... 8735	Codeinæ gr. iij, ter die				
" 25	...11 10	... 1036	... 39·99	... 9197					
" 26	...10 2	... 1035	... 37·89	... 7653					
" 27	...11	... 1032	... 39·99	... 8797	Codeinæ gr. iʒss, ter die				
" 28	...10	... 1034	... 28·80	... 5760					
" 29	...11	... 1031	... 28·80	... 6336					
" 30	...11	... 1035	... 37·89	... 8335					

Cases of Insanities treated by Opium

Date.	Quantity of opium per 24 hours.		Quantity of sugar per 24 hours.		Quantity of sugar per 24 hours.		Medicine.	Diet.	
	no. m.	gr.	grams.	grams.	grams.	grams.			
Oct. 31	20	...	1036	36	...	7200			
Nov. 1	20	20	1037	29-29	...	7747	Codeine gr. iv, ter die	Ordinary mixed diet.	
" 2	3	20	1038	40	...	8150			
" 3	3	14	1037	29-29	...	7736			
" 4	11	...	1034	32-70	...	7794			
" 5	10	...	1036	36	...	7200	Codeine gr. v, ter die		Ordinary mixed diet.
" 6	14	...	1033	34-26	...	6832			
" 7	12	2	1034	34-26	...	7445			
" 8	11	...	1034	37-29	...	7578			
" 9	9	...	1037	34-26	...	6166	Codeine gr. v, ter die		
" 10	10	...	1034	32-70	...	6540			
" 11	3	...	1033	34-26	...	...	
" 12	6	16	1034	25-71	...	3496			
" 13	5	16	1032	31-29	...	3629			
" 14	...	...	...	...	...	...
" 15	5	16	1023	25-71	...	2982			
" 16	5	3	1026	14-40	...	1353			
" 17	5	16	1029	13	...	1740			Codeine gr. v, ter die
" 18	5	16	1023	21-13	...	2453			
" 19	5	...	1030	24	...	2400			
" 20	6	...	1027	17-11	...	2053			
" 21	5	14	1031	22-22	...	2533	Codeine gr. viij, ter die; Tinc. Cate- chu 5j, Mist. Crete 3j, ter die	Restricted diet.	
" 22	5	10	1029	19-98	...	2197			
" 23	4	4	1030	31-29	...	2628			
" 24	3	11	1036	25-71	...	1825			
" 25	3	10	1034	25-71	...	1799	Codeine gr. viijss, ter die		
" 26	3	10	1030	24	...	1680			
" 27	4	2	1037	16-74	...	1323			
" 28	4	...	1029	17-11	...	1368			
" 29	3	14	1032	21-81	...	1613	Codeine gr. ix, ter die		
" 30	4	4	1028	16-35	...	1373			
Dec. 1	5	10	1039	25-71	...	2828			
" 2	5	10	1032	30	...	3300	Codeine gr. x, ter die		
" 3	4	16	1032	28-80	...	2760			
" 4	3	16	1035	19-44	...	1477			
" 5	3	10	1033	16-35	...	1144			
" 6	2	15	1035	14-10	...	775			
" 7	2	16	1025	5-71	...	319			
" 8	2	17	1026	9-99	...	569			
" 9	2	16	1030	6-48	...	362			
" 10	3	6	1030	13-08	...	863			
" 11	3	17	1030	16-74	...	1288			

Remarks.—This patient was for some time treated with codeine without any

n of diet. It could not be perceived that any decided effect was produced. ed diet was now ordered; and, as was to be expected, the quantity of urine and mediately fell. The sugar, however, until lately, has kept up to a considerable amount for the circumstances. Latterly, as may be seen by the report, it has rdn. The patient is still under treatment in the hospital, and the report is p to the latest period allowed for going to press. The quantity of codeine red has been raised to ten grains three times a day. The patient has so much in condition as to look an entirely different man from what he did. His clean, appetite good, and he expresses himself as feeling well, and complains comfort of any sort.

CASE 9.—*Treated with codeine.*

M—, æt. 22, No. 27 bed, Miriam Ward, under Dr. Pavy. Admitted August 3. According to the notes of the case, taken by Mr. Douglas, this patient occupied as a domestic servant. She is a Jewess, and was always remarkably till about four months ago, when she began to ail and feel weak, being able to assign a cause for it. For the last two months has noticed has been passing a very large quantity of urine—as much or more than two in the course of the twenty-four hours. At the same time she has been ly thirsty, and her appetite has been voracious.

a moderately well-nourished, healthy looking girl, with a flushed countenance. Tongue clean, appetite and thirst excessive, bowels regular, catamenia pulse 68, chest sounds normal, skin dry and rather harsh; urine very large quantity, pale coloured, and highly charged with sugar, but not albuminous. diabetes there are manifestations of the existence of secondary syphilis. ily report belonging to this case runs as follows.

Quantity of urine per 4 hours.		Quantity of sugar per fluid ounce.	Quantity of sugar per 24 hours.	Medicine	Diet.
pts. oz.	Sp. gr.	grains.	grains.		
17	... 1037	... 24·81	... 8435	Pulv. Opii gr. j, omni nocte. Aq. Camph. ʒj, ter die	Ordinary mixed diet.
19	... 1035	... 25·71	... 9769		
19	... 1036	... 30·	... 11,400		
17	... 1037	... 19·98	... 6793		
18	... 1035	... 25·71	... 9255		
19	... 1038	... 27·69	... 10,522		
19	... 1037	... 25·71	... 9769		
16	... 1038	... 32·70	... 10,464	Pot. Iodidi gr. v ex Aq. Camph. ʒj, ter die	
16	... 1037	... 34·26	... 10,963		
16	... 1040	... 34·26	... 10,963		
16	... 1038	... 31·29	... 10,012		
?	... 1033	... 24·81	...	?	
19	... 1037	... 34·26	... 13,018	Codeinæ gr. ij, ter die. Rep. Mist.	
17	... 1036	... 22·50	... 7650		
17	... 1038	... 26·64	... 9057		
14	... 1040	... 28·80	... 8064	Codeinæ gr. j, ter die. Rep. Mist.	
16	... 1034	... 27·69	... 8860		
17	... 1036	... 30·	... 10,200		
17	... 1037	... 31·29	... 10,638		
18	... 1036	... 31·29	... 11,264		

Cases of Diabetes treated by Opium

Date.	Quantity of urine per 24 hours.	Quantity of sugar per fluid ounce.	Quantity of sugar per 24 hours.	Medicine.
	pts. oz.	Sp. gr.	grains.	grains.
Aug. 27	...17	... 1037	... 24·81	... 8435
" 28	...15	... 1034	... 24·	... 7200
" 29	...16	... 1036	... 31·29	... 10,012
" 30	...16	... 1032	... 37·89	... 12,124
" 31	...13	... 1045	... 31·29	... 8135
Sep. 1	... 7	... 1040	... 45·	... 6300
" 2	... 9 10	... 1037	... 42·33	... 8042
" 3	...12	... 1039	... 42·33	... 10,159
" 4	... 6 10	... 1040	... 32·7	... 4251
" 5	... 4	... 1040	... 37·89	... 3031
" 6	... 6 10	... 1038	... 34·26	... 4453
" 7	... 6 10	... 1039	... 42·33	... 5502
" 8	... 7	... 1043	... 45·	... 6300
" 9	... 8	... 1039	... 45·	... 7200
" 10	... 7	... 1044	... 48·	... 6720
" 11	... 7	... 1039	... 42·33	... 5926
" 12	... 7 10	... 1044	... 37·89	... 5683
" 13	... 6	... 1043	... 39·99	... 4798
" 14	... 7 10	... 1041	... 30·	... 4500
" 15	... 7 15	... 1041	... 34·26	... 4967
" 16	...10	... 1040	... 34·26	... 6852
" 17	... 7 10	... 1041	... 36·	... 5400
" 18	... 8	... 1040	... 34·26	... 5481
" 19	... 8 10	... 1036	... 28·80	... 4896
" 20	...10 10	... 1040	... 37·89	... 7956
" 21	...10	... 1040	... 30·	... 6000
" 22	...10 10	... 1043	... 30·	... 6300
" 23	... 8 10	... 1042	... 37·89	... 6441
" 24	... 8	... 1040	... 37·89	... 6062
" 25	... 8	... 1040	... 18·	... 2880
" 26	... 8 10	... 1041	... 25·71	... 4370
" 27	...10	... 1040	... 20·55	... 4110
" 28	...10 10	... 1041	... 30·	... 6300
" 29	... 8 10	... ?	... 34·26	... 5824
" 30	... 7 10	... 1045	... 45·	... 6750
Oct. 1	... 6 10	... 1042	... 24·	... 3120
" 2	... 8 10	... 1042	... 20·55	... 3493
" 3	...10	... 1039	... 27·69	... 5538
" 4	... 8 10	... 1040	... 21·81	... 3707
" 5	... 8	... 1040	... 24·81	... 3969
" 6	...11	... 1037	... 24·81	... 5458
" 7	...11 10	... 1038	... 20·55	... 4726
" 8	...10	... 1038	... 18·	... 3600
" 9	... 9 10	... 1036	... 31·29	... 5945
" 10	...11	... 1044	... 21·15	... 4663
" 11	... 9	... 1041	... 36·	... 6480

Codeinæ gr. jss, ter
die. Rep. Mist.

Codeinæ gr. ij, ter
die. Rep. Mist.

Codinæ gr. ijas, ter
die. Rep. Mist.

Codeinæ gr. ij½, ter
die. Rep. Mist.

Codeinæ gr. iij, ter
die. Rep. Mist.

Codeinæ gr. iijas,
ter die. Rep.
Mist.

Codeinæ gr. iv, ter
die. Rep. Mist.

Codeinæ gr. ivas,
ter die. Rep.
Mist.

Codeinæ gr. v, ter
die. Rep. Mist.

Codeinæ gr. vss,
Extr. Aloes gr.
j, ter die. Rep.
Mist.

mi

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.			
Oct. 12	... 8 10	... 1039	... 20·55	... 3493	Codeiæ gr. vj, Ext. Aloes gr. j, ter die. Pot. Iodidi gr. v ex Inf. Gent. co., ter die	} Ordinary mixed diet.	
„ 13	... 9	... 1037	... 28·80	... 5184			
„ 14	... 11	... 1039	... 25·71	... 5656			
„ 15	... 10	... 1039	... 30·	... 6000			
„ 16	... 8 10	... 1037	... 31·29	... 5319			
„ 17	... 10 10	... ?	... ?	... —			
„ 18	... 8	... 1042	... 36·	... 5760	Codeiæ gr. vjss, Extr. Aloes gr. j, ter die. Rep. Mist.		
„ 19	... 8	... 1044	... 27·69	... 4430			
„ 20	... 8	... 1040	... 31·29	... 5006			
„ 21	... 10	... 1038	... 27·69	... 5538			
„ 22	... 8	... 1043	... 36·	... 5760			
„ 23	... 9	... 1041	... 42·33	... 7619	Codeiæ gr. vij, Ext. Aloes gr. j, ter die. Rep. Mist. Codeiæ gr. vijss, Ext. Aloes gr. j, t. d. Ferri Cit. cum Stryc. gr. v ex Aq., ter die		
„ 24	... 9	... 1037	... 30·	... 5400			
„ 25	... 10	... 1038	... 34·26	... 6852			
„ 26	... 7	... 1038	... 34·26	... 4796			
„ 27	... 6 10	... 1040	... 31·29	... 4067			
„ 28	... 7	... 1044	... 30·	... 4200	Codeiæ gr. viij, ter die. Rep. Mist.		
„ 29	... 6	... 1040	... 27·69	... 3322			
„ 30	... 6	... 1042	... 37·89	... 4546			
„ 31	... 7	... 1040	... 42·33	... 5926			
Nov. 1	... 9	... 1041	... 48·	... 8640	Codeiæ gr. vijss, ter die. Rep. Mist.		
„ 2	... 7	... 1045	... 39·99	... 5598			
„ 3	... 9	... 1038	... 34·26	... 6166			
„ 4	... 7	... 1041	... 39·99	... 5598			
„ 5	... 7	... 1039	... 37·89	... 5304	Codeiæ gr. ix, ter die. Mist. Quinæ, ter die		
„ 6	... 7 10	... 1040	... 39·99	... 5998			
„ 7	... 8 10	... 1038	... 37·89	... 6441			
„ 8	... 8	... 1036	... 34·26	... 5481			
„ 9	... 10	... 1039	... 34·26	... 6852			
„ 10	... 9	... 1038	... 32·70	... 5886	Codeiæ gr. ixss, ter die. Rep. Mist.		
„ 11	... 9	... 1036	... 34·26	... 6166			
„ 12	... 8	... 1039	... 31·29	... 5006			
„ 13	... 11	... 1040	... 48·	... 10,560			
„ 14	... 9	... 1042	... 45·	... 8100	Codeiæ gr. x, ter die. Rep. Mist.		
„ 15	... 7	... 1041	... 37·89	... 5304			
„ 16	... 6	... 1046	... 42·33	... 5079			
„ 17	... 6	... 1044	... 42·33	... 5079			
„ 18	... 6 10	... 1041	... 30·	... 3900	Codeiæ gr. v, ter die. Rep. Mist.		
„ 19	... 5	... 1040	... 28·80	... 2880			
„ 20	... 5	... 1040	... 42·33	... 4233			
„ 21	... 5	... 1032	... 18·	... 1800			
„ 22	... 5 10	... 1032	... 17·55	... 1930	Codeiæ, gr. vj, ter die. Rep. Mist.	} Restricted diet.	
„ 23	... 4 10	... 1035	... 19·44	... 1749			
„ 24	... 5	... 1032	... 17·11	... 1711			

Date.	Quantity of urine per 24 hours.	Quantity of sugar per 24 hours.	Quantity of sugar per 24 hours.	Medicine.	Diet.
	grs. or	grs. or	grams		
Nov. 25 ... 5	1835	25.71	2571	Codeine gr. vj, ter die. Rep. Mist.	
" 26 ... 5	1834	19.44	1944		
" 27 ... 5	1849	36	3600		
" 28 ... 5 10	1834	28.80	3168		
" 29 ... 6	1836	32.79	1024	Codeine gr. vij, ter die. Rep. Mist.	
" 30 ... 5	1836	21.15	2115		
Dec. 1 ... 6	1832	17.55	2106		
" 2 ... 5	1835	24	2000		
" 3 ... 5	1836	28.80	2880	Codeine gr. viij, ter die. Rep. Mist.	Restrictive diet.
" 4 ... 5	1835	21.15	2115		
" 5 ... 5	1833	15.63	1563		
" 6 ... 5	1838	24	2400		
" 7 ... 4 10	1836	18.39	1655		
" 8 ... 5	1837	22.22	2222		
" 9 ... 4 10	1837	21.15	1903		
" 10 ... 5	1838	34.26	3426		
" 11 ... 4	1840	25.71	1736		

Remarks.—In this case the codeine was at first administered with a mixed diet to ascertain what it would do alone in a young patient affected with a very severe form of the disease.

The patient, from the 7th to the 19th of August, was not under special treatment for diabetes. The iodide of potassium was administered for some syphilitic symptoms that existed, and the one-grain opium pill at night, taken during the first portion of the time, was simply ordered to relieve nocturnal rheumatism. The urine during this period ranged between sixteen and nineteen pints for the twenty-four hours. A two-grain dose of codeine three times a day was now ordered; but in a couple of days it had to be reduced to one grain, on account of the headache and giddiness that were produced. From the one grain the dose was gradually increased, and the urine and sugar, as seen by the report, although fluctuating to some extent, underwent a notable diminution. The quantity of urine, instead of ranging, as at first, between sixteen and nineteen pints, averaged about eight, and upon one day (September 3rd) fell to as low as four. The sugar also showed a marked descent. Notwithstanding, however, that the dose had been raised to ten grains three times daily, the urine and sugar were still in considerable quantity. A restricted diet was now ordered, and the codeine reduced to five-grain instead of ten-grain doses, as I was apprehensive lest, under the mitigation of the symptoms that would follow the alteration in the diet, the codeine would be allowed to act with greater energy, and the original dose be found too strong. The sugar, as was to be expected, has been considerably lessened, but a satisfactory result can by no means be considered in this case to have been attained. The patient is still within the hospital.

CASE 10.—*Treated with codeine.*

George G—, æt. 33, admitted into Guy's Hospital July 14th, 1869, under my colleague Dr. Rees, and placed in No. 11 bed, Philip Ward. Transferred to my care August 19th amongst the patients falling under my charge during the autumn recess. The history is taken from the notes of Mr. Buchanan.

Admits that he has been a very intemperate man. About four years back had jaundice, which lasted about two months. Then enjoyed good health until twelve months ago, when he had swelling of his legs and feet. At this time also noticed that his body was undergoing rapid emaciation, that he had great thirst, and that he was passing a large quantity of pale urine, having to get out of bed several times during the night for the purpose of micturating. Gave up work, and obtained admission into the Gravesend Union, where he remained until a fortnight before his admission into Guy's Hospital. States that whilst in the union he was not subjected to medical treatment, and that his condition gradually grew worse.

Upon admission into the hospital he is described as being an emaciated man, with sharp features and a fresh colour; as having a hot and dry skin, and a furred and fissured tongue; as suffering from cough, attended with much effort to expectorate; and as passing about a gallon of urine per day, which was found to be charged with sugar. The heart sounds are reported as being normal.

He was first of all ordered, I perceive, a mixture consisting of the carb. of soda with aqua menthæ, and two grains of carbolic acid in the form of pill three times a day. A mixed diet was given—in the first place the ordinary middle diet of the hospital, and then a diet consisting of 10 oz. of meat, 10 oz. of bread, greens, tea with milk, mutton chop for breakfast, and 4 oz. of butter. Subsequently 1 pint of beer was added.

July 17th, the quantity of urine passed is stated to have been 13 pints, with a sp. gr. of 1040; 18th, it was 12 pints; 19th, 13½ pints; 20th, 12 pints; and from this time to August 19th the quantity ranged between 9 pints and upwards. August 10th he was ordered, in the place of his previous medicine, $\mathfrak{S}i$ of carb. of magn., gr. v. of Dover's Powder, ex Aquâ Menthæ, three times a day, with 5 grs. of the Pil. Hydr. Chlor. co. omni nocte. On the 14th this was changed to Tinct. Opii $\mathfrak{m}xl$ ex Mist. Magnesiz ter quotidie. On the 10th I observe it noted, "Patient complains much of cough, with pain in the right side of the chest." On the 12th, it is stated that the ankles and legs were swelled from œdema; and on the 13th the report runs—"Both legs very œdematous to-day, pitting deeply on pressure. The urine gives no precipitate with nitric acid, but becomes cloudy with the tinct. of galls."

The first examination of the urine made under my direction gave a sp. gr. of 1043, and an amount of sugar reaching 45 grains to the fluid ounce. This was for August 19th.

August 20th, the quantity of urine for the twenty-four hours was 9 pints, and its sp. gr. 1040. The analysis showed a presence of sugar to the extent of 32·70 grs. to the oz., which would give 5886 grs., or a little over three quarters of a pound, as the quantity of sugar passed in the twenty-four hours.

August 21st, the patient was placed upon the codeine treatment, and the daily

results observed are stated below. A two-grain dose three times a day was commenced with, as he had been taking since August 14th three times daily a draught consisting of 40 minims of the tincture of opium in the magnesia mixture.

Date.	Quantity of urine.		Quantity of sugar.		Medicine.	Diet.
	pts.	oz.	Sp. gr.	grains.		
Aug. 21 ...	9	...	1040	6480	Codeinæ gr. ij, ter die	Same as the patient had previously been taking, viz. meat 10 oz., bread 10 oz., greens, tea with milk, chop for breakfast, and butter 4 oz.
" 22 ...	10	...	Not examined, through being inadvertently thrown away			
" 23 ...	10	...	1040	6000		
" 24 ...	5	10	1044	4398		
" 25 ...	5	...	1043	3270		
" 26 ...	5	0	1042	3000	Codeinæ gr. ijsa, ter die	
" 27 ...	4	1	1045	2083		
" 28 ...	3	6	1044	1532		
" 29 ...	2	8	Not examined			
" 30 ...	3	7				
" 31 ...	2	10				
Sept. 1 ...	5	...				
" 2 ...	3	...	Not examined		Codeinæ gr. iij, ter die	
" 3 ...	2	...				
" 4 ...	2	10				
" 5 ...	2	8				
" 6 ...	2	4	1010	No sugar		

It will be observed that no change was made in the dietary in this case, and that under the administration of codeine the urine, in the space of a little over a fortnight, fell from nine and ten pints in the twenty-four hours to between two and three, and the sugar from 6000 grains, or nearly an avoirdupois pound, to nil. The urine, as mentioned in the report, from August 29th to September 5th was not examined chemically.

September 6th.—The examination of the urine was made during an ordinary visit to the ward. I had not expected the favorable result that was observed.

The patient was now complaining of being much troubled with his cough, and there was also a considerable amount of oedema of the feet and ankles. Upon submitting his chest to examination I discovered that there were marked physical signs of phthisis discoverable, especially over the upper part of the right lung. For this he was ordered an expectorant mixture, and the Lin. Iodi to be applied under the right clavicle.

7th.—The quantity of urine passed was two pints; but this is all that is known, as it was not submitted to examination.

8th.—The patient seemed in his usual state on my visit to the ward. He also, it appears, went to bed in the evening without anything particular being noticeable with regard to his condition.

About 1 a.m. on the 9th he was observed to be breathing very hurriedly, and the house-physician was called to him. There were no convulsions or coma, but the breathing became more embarrassed, and he died at 3.50 a.m.

A post-mortem examination was made the day of death. It was noted that there was oedema of the eyelids, ankles, and feet. The brain is reported as having been found healthy, and nothing unnatural was observed about the heart. Pleuritic adhesions existed at the upper part of both sides of the chest. The upper and middle lobes, and likewise the upper part of the lower lobe, of the right lung were in a state of consolidation, readily breaking down under the finger, and with cheesy tubercle and three or more recent cavities in the upper lobe. Upon the left side there were cavities in and consolidation of the upper lobe. The pericardium contained four ounces of fluid, and there was also a small quantity of fluid in the peritoneum. Liver healthy. Kidneys dark in colour, and very firm. No reaction with iodine of lardaceous deposit.

The cause of death in this case remains obscure. The post-mortem examination failed to afford a satisfactory explanation. There was, it is true, pretty extensive disease of the lungs encountered, but what constituted the immediate cause of death in so comparatively sudden a manner remains unrevealed. As far as regards the diabetes, the case formed a striking illustration of the controlling power over the disease enjoyed by codeine.

CASE 11.—*Treated with Codeine.*

Thomas T.—, æt. 34. According to the report of Mr. Harris this patient was admitted into John Ward, No. 5, under Dr. Pavy's care, April 14th, 1869. Had been a labourer by occupation. Father and mother alive. No family history of diabetes, and could assign no cause for the commencement of his complaint. Quite well up to four months ago, when he began to experience excessive hunger and thirst. Then noticed that he passed more than the usual quantity of urine. Never measured the quantity previous to admission, but was sometimes called upon to pass it as frequently as every hour. His skin has been dry, and he has been losing flesh. Heart and lungs healthy. Bowels constipated.

Date	Quantity of sugar per 24 hours	Quantity of sugar per 24 hours	Quantity of sugar per 24 hours	Medicine	Diet
Apr 15	2 4	1040	1224		Ord. mixed
" 16	2 4	1022	1203		
" 17	2 4	1013	1172		
" 18	2 16	1022	1147		
" 19	2 2	1020	974		
" 20	2 12	1020	942		
" 21	2 12	1022	944		
" 22	2 2	1017	Slight sugar		
" 23	2 4	1020	No sugar		
" 24	2 12	1020	945		Restrict
" 25	2 2	1022	979		diet, consti
" 26	2 2	1021	945		of meat,
" 27	2 2	1021	945		mond bis
" 28	2 12	1020	945		greens,
" 29	2 12	1021	1043		beef-tea,
" 30	2 4	1020	9		4 oz. of br
May 1	2 12	1024	352		
" 2	2 4	1017	358		
" 3	2 4	1016	Slight sugar		
" 4	2 11	1016	No sugar	Aq. Camphoræ ʒj.	
" 5	2 4	1018	Do.	ter die	
" 6	2 3	1027	Do.		
" 7	2 6	1017	Do.		
" 8	2 16	1021	Do.		
" 9	2 6	1016	Do.		Restrict
" 10	2 2	1020	Do.		diet, with
" 11	2 3	1026	Do.		addition
" 12	2 3	1022	Do.		oz. of br
" 13	2 7	1027	Do.		
" 14	2 14	1026	Do.		
" 15	2 8	1031	439		
" 16	2 8	1030	Slight sugar		
" 17	2 2	1025	Do.		
" 18	2 12	1027	No sugar		
" 19	2 2	1027	Slight sugar		
" 20	2 10	1017	Do.		
" 21	2 2	1027	857		Restrict
" 22	2 9	1030	585		diet, with
" 23	2 16	1029	10		addition
" 24	2 3	1030	15		oz. of br
" 25	2 17	1031	1333		
" 26	2 3	1034	15	Mist. Crete ʒj, ter	
" 27	2 14	1036	827	sepsive quo-	
" 28	2 4	1034	1333	tidie diarrhoea	
" 29	2 5	1031	1333	urgente	
" 30	2 19	1035	1333		

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.		Medicine.	Diet.
	pts.	oz.	Sp. gr.	grains.	grains.			
May 31	3	11	1035	10-90	773		Mist. Cretæ ʒij, ter	
June 1	3	10	1034	21-15	1480		æquasve quo-	
" 2	3	5	1034	19-98	1298		tidie diarrhœa	
" 3	3	8	1032	9-60	652		urgente	
" 4	3	18	1033	24	1872			
" 5	2	14	1030	20-55	1109		Codeinæ gr. ss, ter	
" 6	2	12	1031	15-99	831		die	
" 7	2	9	1034	14-40	705		Codeinæ gr. j, ter	Restricted
" 8	2	3	1032	10-43	448		die	diet, with the
" 9	2	5	1034	24	1080			addition of 4
" 10	2	6	1032	13-83	636		Codeinæ gr. jss, ter	oz. of bread.
" 11	2	6	1020	13-08	601		die	
" 12	1	10	1028	No sugar	...			
" 13	1	14	1030	Do.	...			
" 14	3	...	1024	Do.	...		Codeinæ gr. ij, ter	
" 15	2	5	1022	Do.	...		die	
" 16	2	10	1025	Do.	...			
" 17	2	9	1027	Do.	...			Restricted
" 18	2	8	1022	Do.	...			diet, with the
" 19	2	2	1024	Do.	...			addition of 6
" 20	2	8	1030	9-23	443			oz. of bread.
" 21	2	7	10-31	9-23	433		Codeinæ gr. ijas,	
" 22	2	4	1024	Slight sugar	...		ter die	
" 23	2	12	1026	No sugar	...			
" 24	2	19	1027	Do.	...			
" 25	2	11	1027	3-52	179			Restricted
" 26	2	16	1026	7-74	433			diet, with the
" 27	3	2	1019	No sugar	...			addition of 8
" 28	2	10	1028	6-66	333		Codeinæ gr. iij, ter	oz. of bread.
" 29	2	18	1031	7-56	438		die	
" 30	1	18	1030	9-09	345			
July 1	1	15	1030	Slight sugar	...			
" 2	1	14	1027	No sugar	...			
" 3	1	14	1010	Do.	...			
" 4	2	4	1029	5	220		Codeinæ gr. iijss, ter	
" 5	2	9	1022	Slight sugar	...		die	
" 6	3	...	1027	4-21	252			
" 7	2	4	1029	3-69	162			
" 8	1	17	1029	4-13	152			
" 9	5	14	1020	4-21	479		Codeinæ gr. iv ter	Ordinary
" 10	1	18	1029	Slight sugar	...		die	mixed diet.
" 11	4	12	1024	No sugar	...			
" 12	1	17	1023	Slight sugar	...		Codeinæ gr. ivss,	
" 13	1	14	1032	5-33	181		ter die	
" 14	1	14	1027	2-82	95			

Cases of Diabetes treated by Opium

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.			
July 15 ...	2 12 ...	1030 ...	8·27 ...	430	} Codeinæ gr. v, ter die	} Ordinary mixed diet.	
„ 16 ...	2 14 ...	1030 ...	5·33 ...	287			
„ 17 ...	3 2 ...	1018 ...	Slight sugar	...			
„ 18 ...	3 3 ...	1027 ...	No sugar	...	} Codeinæ gr. vss, ter die		
„ 19 ...	4 3 ...	1017 ...	Slight sugar	...			
„ 20 ...	5 2 ...	1014 ...	2 92 ...	297			
„ 21 ...	5 4 ...	1010 ...	No sugar	...	} Codeinæ gr. vj, ter die		
„ 22 ...	6 5 ...	1010 ...	Trace of sugar	...			
„ 23 ...	4 3 ...	1019 ...	Do. ...	...		
„ 24 ...	4 4 ...	1016 ...	Do. ...	...		
„ 25 ...	4 10 ...	1035 ...	No sugar	...			
„ 26 ...	2 5 ...	1029 ...	Do. ...	...		
„ 27 ...	4 8 ...	1021 ...	Do. ...	...		
„ 28 ...	4 9 ...	1018 ...	Do. ...	...		
„ 29 ...	5 ...	1017 ...	Do. ...	...		
„ 30 ...	4 8 ...	1027 ...	Slight sugar	...			
„ 31 ...	3 7 ...	1026 ...	Do. ...	...		
Aug. 1 ...	2 ...	1030 ...	No sugar	...	} Codeinæ gr. vj, Ext. Aloes, gr. ij, ter die. Pot. Bicarb. gr. x, Sp. Am. Ar. ʒss, Tr. Lav. co. mxx, Inf. Gent. co. ʒj, ter die		
„ 2 ...	4 2 ...	1025 ...	Slight sugar	...			
„ 3 ...	3 12 ...	1024 ...	2·66 ...	191			
„ 4 ...	4 10 ...	1017 ...	Slight sugar	...			
„ 5 ...	3 5 ...	1023 ...	No sugar	...			
„ 6 ...	3 18 ...	1021 ...	3·80 ...	296			
„ 7 ...	3 18 ...	1022 ...	Slight sugar	...			
„ 8 ...	4 16 ...	1030 ...	9·60 ...	921			
„ 9 ...	2 12 ...	1025 ...	4·28 ...	222			
„ 10 ...	4 8 ...	1022 ...	Slight sugar	...			
„ 11 ...	4 10 ...	1021 ...	No sugar	...			
„ 12 ...	5 4 ...	1019 ...	Do. ...	...		
„ 13 ...	5 4 ...	1018 ...	Slight sugar	...			
„ 15 ...	4 4 ...	1022 ...	No sugar	...			
„ 16 ...	3 18 ...	1019 ...	Do. ...	...		
„ 17 ...	3 16 ...	1021 ...	Do. ...	...		
„ 18 ...	5 11 ...	1019 ...	2·40 ...	266			
„ 19 ...	3 6 ...	1022 ...	Slight sugar	...			
„ 20 ...	4 12 ...	1017 ...	No sugar	...	} Codeinæ gr. vij, Ext. Aloes gr. iij, ter die. Rep. Mist.		
„ 21 ...	4 12 ...	1024 ...	Slight sugar	...			

Remarks.—This case is a very peculiar one. On reference to the report it may be seen that upon admission into the hospital the patient seemed to be suffering from a very severe form of diabetes. April 16th, the patient being on an ordinary mixed diet, fourteen pints four ounces of urine were passed, with a sp. gr. of 1044 and containing altogether 10,224 grains of sugar. He was placed upon a restricted

diet, and only the camphor mixture as medicine ordered. With this treatment the sugar disappeared. He was now allowed two ounces of bread *per diem*, and, to my surprise, the urine still remained devoid of sugar. Next, four ounces of bread were allowed. This soon, although not immediately, led to a decided escape of sugar from the system. The amount, however, was not large, but seemed to be increasing. Without altering the diet, codeine, in increasing doses, was ordered, and soon the sugar disappeared. The quantity of bread was increased to six ounces, then to eight, and next the ordinary mixed diet of the hospital was allowed; subsequently, however, he was put back upon the restricted diet with eight ounces of bread. The urine fluctuated in condition between an absence of sugar and the presence of a small amount. He was discharged by the hospital authorities on account of misconduct in the ward, otherwise I should have kept him under observation longer.

CASE 12.—*Treated with codeine.*

This case, I see, my ward clerks, in their report of the present attack, have styled recurrent diabetes. It is the case (Case 2) of the elderly female patient who had been on a former occasion treated successfully with opium, and exhibited at the Clinical Society. As the report will show, the patient had remained well until just previous to her second admission, when a return of her complaint appeared. The history of the case previous to the present attack will be found at p. 425. I will only give here that which bears on the effect produced by codeine.

Sarah P—, now aged 69. It was in May, 1868, that this patient was first admitted into Guy's Hospital under my care. She was discharged at the end of October, passing no sugar, having left off the opium with which she had been treated, and taking, as she had all along been allowed to do, a mixed diet. She continued under my occasional observation till the end of May, and each time she appeared her urine was examined and found to be free from sugar. Towards the end of August she came to see me at the hospital, and expressed her fears that her old complaint had returned. She was feeling weak and ill, experiencing some amount of thirst, and passing a larger quantity of urine than natural. She stated that she had continued well up to a week or two previously, when she undertook to look after, in her capacity of nurse, a person affected with mental derangement. This kept her in a constant state of worry and excitement, and she felt day by day that it was too much for her, and that it was telling injuriously upon her. It was now that she sought my advice at the hospital. She had not measured her urine, but she judged that she was passing about four pints in the twenty-four hours. A specimen brought to me August 26th was of a sp. gr. 1036, and contained $27\frac{1}{2}$ grains of sugar to the ounce. Another specimen brought August 28th showed a sp. gr. of 1042, and contained thirty grains of sugar to the ounce. I recommended her at once again to come into the hospital, determining to place her this time upon the codeine treatment. The following tabulated report shows the treatment adopted and the daily condition of the urine observed.

Cases of Diabetes treated by Opium

Date.	Quantity of urine per 24 hours.	Sp. gr.	Quantity of sugar per fluid ounce.	Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts.oz.		grains.	grains.		
Aug. 26 ... 4	...	1036	27.75	2220	None ...	
" 28 ... 4	...	1042	30	2400		
" 31 ... 3					Codeinæ gr. $\frac{1}{2}$, t. d.	
Sept. 1 ... 2 15						
" 2 ... 3					Codeinæ gr. $\frac{3}{4}$, Extr. Aloes gr. j, ter die	
" 3 ... 2 10						
" 4 ... 2 15						
" 5 ... 2 10						
" 6 ... 2						
" 7 ... 2 15		Not examined		...	Codeinæ gr. j, Extr. Aloes gr. j, ter die	
" 8 ... 2 10						
" 9 ... 2 10						
" 10 ... 2 5						
" 11 ... 2						
" 12 ... 2 10					Codeinæ gr. $1\frac{1}{2}$, Extr. Aloes gr. j, ter die	
" 13 ... 2 15						
" 14 ... 3 5		—	37.89	2462		
" 15 ... 1 5		1038	30	750		
" 16 ... 2		1034	18.39	735		
" 17 ... 2		1027	17.55	702	Codeinæ gr. jss, Extr. Aloes gr. j, t. d.	
" 18 ... 2		1021	16.35	654		
" 19 ... 2		1034	18.39	735		
" 20 ... 2 5		1028	14.07	633		
" 21 ... 2 10		1025	11.07	553		
" 22 ... 2 5		1018	7.20	324	Codeinæ gr. i, Extr. Aloes gr. j, ter die	
" 23 ... 1 15		1024	5.45	190		
" 24 ... 2 10		1017	2.40	120		
" 25 ... 2 5		1018	Slight sugar	...		
" 26 ... 2 5		1019	Do.	...		
" 27 ... 2 10		1022	2.40	120	Codeinæ gr. ij, Extr. Aloes gr. j, ter die	
" 28 ... 2 5		1019	Slight sugar	...		
" 29 ... 2 5		1018	Do.	...		
" 30 ... 2		1022	2.40	96		
Oct. 1 ... 1 15		1015	No sugar	...		
" 2 ... 2		1012	Do.	...	Codeinæ gr. iijss, Extr. Aloes gr. j, ter die	
" 3 ... 2 5		1020	Do.	...		
" 4 ... 1 10		1018	Trace of sugar	...		
" 5 ... 2		1023	Slight sugar	...		
" 6 ... 1 15		1023	4.80	168		
" 7 ... 2		1020	No sugar	...	Codeinæ gr. iij, Extr. Aloes gr. j, ter die	
" 8 ... 1 10		1019	Do.	...		
" 9 ... 1 10		1019	Do.	...		
" 10 ... 1 15		1020	Slight sugar	...		
" 11 ... 1 10		1019	No sugar	...		
" 12 ... 2		1016	Do.	...		
" 13 ... 1 15		1022	Do.	...		

Ordinary
mixed diet

Case.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.		Medicine.	Diet.
	pts. oz.		Sp. gr.	grains.		grains.		
14	2	...	1022	...	No sugar	...	Codeine gr. iij, Ext. Aloes gr. j, ter die	Ordinary mixed diet.
15	1 10	...	1021	...	Do.	...		
16	1 10	...	1017	...	Do.	...		
17	2	...	1022	...	5.33	213	Codeine gr. iijss, Extr. Aloes gr. j, ter die	
18	1 15	...	1022	...	6.48	226		
19	1 10	...	1020	...	No sugar	...		
20	1 10	...	1019	...	Do.	...	Codeine gr. iv, Ext. Aloes gr. j, ter die	
21	...	...	1019	...	Do.	...
22	2	...	1018	...	3.24	129		
23	2 5	...	1019	...	No sugar	...	Codeine gr. ivss, Ext. Aloes gr. j, t. d. Ferri Citr. cum Quina gr. v ex Aquæ ʒj, t. d.	
24	1 10	...	...	...	...	...
25	2	...	1019	...	Do.	...		
26	2 10	...	1020	...	Do.	...		
27	2 10	...	1019	...	Do.	...		
28	2	...	1017	...	Trace of sugar	...	Codeine gr. v, Ext. Aloes gr. j, ter die. Rep. haustus	
29	1 15	...	1018	...	No sugar	...		
30	2	...	1019	...	Do.	...		
31	2 5	...	1015	...	Do.	...		
1	1 15	...	1019	...	Trace of sugar	...		
2	1 10	...	1018	...	Do.	...		
3	1 15	...	1021	...	No sugar	...		
4	2	...	1020	...	Trace of sugar	...		
5	2 5	...	1024	...	No sugar	...		
6	2 10	...	1023	...	Do.	...		
7	2 5	...	1026	...	Do.	...		
8	2	...	1015	...	Do.	...		
9	2 10	...	1018	...	Trace of sugar	...		
10	2 15	...	1021	...	No sugar	...		
11	2 5	...	1019	...	Do.	...		
12	2 10	...	1026	...	Trace of sugar	...		
14	2 15	...	1019	...	No sugar	...		
15	2 10	...	1021	...	Trace of sugar	...		
16	2 15	...	1024	...	No sugar	...		
17	2 15	...	1020	...	Do.	...		
							Nil	

Remarks.—The diabetes here yielded in a very direct manner to the administration of codeine. Throughout the treatment the patient was kept upon an ordinary mixed diet. The dose of codeine was not raised beyond five grains three times a day. Sugar having been for some time absent, or only present to the extent of a trace, the codeine was all at once ordered to be discontinued. The patient remained in the hospital for a week afterwards, and the urine during this time continued in the same satisfactory state as before. Being anxious to return home as soon as I said she might go, she was now discharged for the second time in a cured condition from the hospital.

CASE 13.—*Treated with codeine.*

Joseph S—, æt. 56, admitted into Philip Ward, Guy's Hospital, July 28th, 1869. Enjoyed good health until about six weeks ago, when he began to experience an unquenchable thirst, and to pass an excessive quantity of urine. There was also loss of appetite, and he became so weak as to be unable to follow his occupation as a malster. Since his illness he has lost flesh considerably; his skin is dry; his tongue red, dry, and fissured, and his taste so impaired that he can hardly discern what food he is eating. Bowels constipated; pulse 64; heart sounds normal; lungs healthy; urine pale, loaded with sugar, but free from albumen.

Between the date of his admission and the middle of August, when he fell under my care, the urine ranged in quantity between five and ten pints for the twenty-four hours. He was taking an ordinary mixed diet, and towards the latter end of the time was ordered increasing doses of the tincture of opium. Upon falling under my charge I ordered him to be placed upon a restricted diet, and to take codeine medicine. The following report shows the daily progress of his case.

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.	Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.		
Aug. 19 ...	?	1033	32.70	?	Tinct. Opii mxi ex Mist. Magnesie bis die	Ordinary mixed diet with fish instead of meat
" 20 ...	8	1032	25.71	4113		
" 21 ...	7 15	1031	24.81	3845		
" 22 ...	6	1036	28.80	3456		
" 23 ...	5 10	1039	36	3960		
" 24 ...	3 7	1039	24.81	1662	Codeine gr. j, Ext. Aloes gr. ij, Ext. Nucis Vomice gr. j, ter die	Restricted diet.
" 25 ...	2 16	1037	25.71	1439		
" 26 ...	1 18	1033	14.40	547		
" 27 ...	2 10	1027	8.46	423		
" 28 ...	1 11	1028	7.32	226		
" 29 ...	2		Trace of sugar			
" 30 ...	1 8		No sugar			
" 31 ...	1 16				Codeine gr. jss, Ext. Aloes gr. j, Ext. Nucis Vom. gr. j, ter die	Restricted diet.
Sept. 1 ...	3	Not examined				
" 2 ...	2 8					
" 3 ...	2 6					
" 4 ...	2 8					
" 5 ...	3 8		No sugar		Codeine gr. ij, Ext. Aloes gr. j, Ext. Nucis Vom. gr. j, ter die	Restricted diet.
" 6 ...	2 13		Do.			
" 7 ...	1 18	Not examined				
" 8 ...	2 5					
" 9 ...	2 7					
" 10 ...	2 9					
" 11 ...	2 4					
" 13 ...	2 8	1018	No sugar			
" 14 ...	2 10	1017	Do.			
" 15 ...	2 7	1017	Do.			
" 16 ...	2 7	1016	Trace of sugar			

Date.	Quantity of urine per 24 hours.		Sp. gr.	Quantity of sugar per fluid ounce.		grains.	Quantity of sugar per 24 hours.	grains.	Medicine.	Diet
Sept. 17	...	2 11	...	1018	...	No sugar	Codeinæ gr. ijss,	Restricted diet.
" 18	...	2 7	...	1017	...	Do.	...	...	Ext. Aloes gr. j,
" 19	...	2 11	...	1017	...	Do.	...	...	Ext. Nucis Vom.
" 20	...	2 12	...	1019	...	Do.	...	...	gr. j, ter die
" 21	...	3	...	1017	...	Do.	...	...	Codeinæ gr. iij, Ext.
" 22	...	2 8	...	1018	...	Do.	...	...	Aloes gr. j, Ext.
" 23	...	2 11	...	1016	...	Do.	...	...	Nucis Vom. gr.
" 24	...	2 16	...	1016	...	Do.	...	...	j, ter die
" 25	...	2 6	...	1017	...	Do.	...	...	Codeinæ gr. ijss,
" 26	...	2 9	...	1018	...	Do.	Ext. Aloes gr. j,	Restricted diet, with 2 oz. of bread per diem.
" 27	...	2 4	...	1016	...	Do.	...	...	Ext. Nucis Vom.
" 28	...	2 5	...	1017	...	Do.	...	...	gr. j, ter die
" 29	...	2 6	...	1016	...	Do.	...	...	Codeinæ gr. iv, Ext.
" 30	...	2 4	...	1017	...	Do.	...	...	Aloes gr. j, Ext.
Oct. 1	...	2 11	...	1017	...	Do.	...	...	Nucis Vom. gr.
" 2	...	2 4	...	1017	...	Do.	...	...	j, ter die
" 3	...	2 8	...	1018	...	Do.	...	...	Codeinæ gr. ivss,
" 4	...	2 9	...	1018	...	Do.	...	...	Ext. Aloes gr. j,
" 5	...	2 5	...	1018	...	Do.	...	...	Ext. Nucis Vom.
" 6	...	2 6	...	1018	...	Do.	gr. j, ter die	Restricted diet, with 6 oz. of bread per diem.
" 7	...	2 5	...	1019	...	Do.	...	...	Codeinæ gr. v, Ext.
" 8	...	2 11	...	1017	...	Do.	...	...	Aloes gr. j, Ext.
" 9	...	2 11	...	1017	...	Do.	...	...	Nucis Vom. gr. j,
" 10	...	2 9	...	1021	...	Do.	...	...	ter die
" 11	...	2 12	...	1018	...	Do.	...	...	Codeinæ gr. vss,
" 12	...	2 9	...	1017	...	Do.	...	...	Ext. Aloes gr. j,
" 13	...	2 10	...	1017	...	Do.	...	...	Ext. Nucis Vom.
" 14	...	2 10	...	1019	...	Do.	...	...	gr. j, ter die
" 15	...	2 9	...	1018	...	Do.	Codeinæ gr. vj,	Restricted diet, with 10 oz. of bread per diem.
" 16	...	2 10	...	1017	...	Do.	...	...	Ext. Aloes gr. j,
" 17	...	2 9	...	1018	...	Do.	...	...	Ext. Nucis Vom.
" 18	...	2 12	...	1018	...	Do.	...	...	gr. j, ter die
" 19	...	2 9	...	1018	...	Do.	...	...	Codeinæ gr. vjss,
" 20	...	2 13	...	1019	...	Do.	...	...	Ext. Aloes gr. j,
" 21	...	2 12	...	1018	...	Do.	...	...	Ext. Nucis Vom.
" 22	...	2 12	...	1019	...	Do.	...	...	gr. j, ter die
" 23	...	2 13	...	1019	...	Do.	Codeinæ gr. vij, Ext.	Ordinary mixed diet.
" 24	...	2 13	...	1017	...	Do.	...	...	Aloes gr. j, Ext.
" 25	...	2 12	...	1018	...	Do.	...	...	Nucis Vom. gr. j,
" 26	...	2 13	...	1019	...	Do.	...	...	ter die
" 27	...	2 9	...	1018	...	Do.	...	...
" 28	...	2 12	...	1019	...	Do.	...	...
" 29	...	2 12	...	1017	...	Do.	...	...
" 30	...	2 13	...	1018	...	Do.	...	...

Cases of Diabetes treated by Opium

Date.	Quantity of urine per 24 hours.		Quantity of sugar per fluid ounce.		Quantity of sugar per 24 hours.	Medicine.	Diet.
	pts. oz.	Sp. gr.	grains.	grains.			
Oct. 31 ...	2 10	...	1021	No sugar	...	Codeinæ gr. v, Ext.	
Nov. 1 ...	2 13	...	1019	Do.	...	Aloes gr. j, Ext.	
" 2 ...	3 4	...	1018	Do.	...	Nucis Vom. gr. j,	
" 3 ...	3	...	1020	Do.	...	ter die	
" 4 ...	3 5	...	1016	Trace of sugar	...	Codeinæ gr. iij, Ext.	
" 5 ...	3 5	...	1018	No sugar	...	Aloes gr. j, Ext.	
" 6 ...	3 4	...	1018	Do.	...	Nucis Vom. gr. j,	
" 7 ...	3 4	...	1019	Trace of sugar	...	ter die	
" 8 ...	3 7	...	1018	No sugar	...		
" 9 ...	3 4	...	1019	Trace of sugar	...	Codeinæ gr. j, Ext.	
" 10 ...	3 8	...	1020	6·66	451	Aloes gr. j, Ext.	
" 11 ...	?	...	1021	No sugar	...	Nucis Vom. gr. j,	
" 12 ...	4	...	1015	Do.	...	ter die	
" 13 ...	3	...	1017	Do.	...		
" 14 ...	3 4	...	1015	Do.	...		
" 15 ...	3 10	...	1019	Trace of sugar	...		
" 16 ...	3 4	...	1024	7·27	465		
" 17 ...	3 10	...	1019	17·13	1199	Nil	
" 18 ...	3 11	...	1025	10·90	773		
" 19 ...	5 9	...	1021	7·05	768		
" 20 ...	3 14	...	1023	8·88	647		
" 21 ...	3	...	1025	2·58	154		
" 22 ...	3 12	...	1017	Slight sugar	...		
" 23 ...	3	...	1020	Trace of sugar	...		
" 24 ...	3 4	...	1020	No sugar	...		
" 25 ...	3 5	...	1019	Do.	...		
" 26 ...	3 4	...	1020	Slight sugar	...	Codeinæ gr. iij, ter	
" 27 ...	3	...	1022	2·40	144	die	
" 28 ...	2 12	...	1021	2·40	124		
" 29 ...	3	...	1020	6·13	367		
" 30 ...	3	...	1020	6·48	388		
Dec. 1 ...	3 4	...	1022	6·13	392		
" 2 ...	3 4	...	1025	4·28	273		
" 3 ...	3 5	...	1016	Trace of sugar	...		
" 4 ...	3 4	...	1015	No sugar	...		
" 5 ...	3 4	...	1026	Do.	...		
" 6 ...	3 6	...	1017	Do.	...	Codeinæ gr. v, ter	
" 7 ...	3 4	...	1018	Do.	...	die	
" 8 ...	3 7	...	1015	Do.	...		
" 9 ...	3	...	1018	Do.	...		
" 10 ...	3	...	1018	Do.	...		
" 11 ...	3 4	...	1019	Do.	...		

Ordinary
mixed diet.

Remarks.—This case affords most conclusive evidence of the efficacy of codeinæ in controlling the elimination of sugar. The patient had been in the hospital for about

weeks before he fell under my charge. During this time he had been taking a diet, and for a few days the tincture of opium, the dose of which had been used to forty minims twice a day. He was now passing about 3500 to 4000 of sugar a day, and urine ranging in quantity from $5\frac{1}{2}$ to 8 pints. I put him on a restricted diet, and ordered him to begin with one-grain doses of codeine three times a day. This plan had not been pursued more than six days before the sugar disappeared. The dose of codeine, however, was gradually increased, and after it had been taken for about a month 2 oz. of bread per diem were allowed. There being no appearance of sugar in the urine, the allowance of bread was increased to 4 oz., then 8, then 10, then 12, and now the ordinary mixed diet of the hospital, the same that he was taking originally, was ordered. The urine all this time remained free from sugar, the dose of codeine he was taking having been raised to 7 grains three times a day. The codeine was now diminished, first to five-grain doses, then to three, then one, and was afterwards taken off altogether. The sugar now reappeared in the urine, and one day reached to 1199 grains in quantity. The codeine was again ordered, beginning at once with three grains three times daily, and immediately its effect was observable. As a little sugar, however, continued to be passed, the dose of codeine was increased to five grains instead of three, and since then the sugar has once more entirely disappeared.

A NEW
METHOD OF TREATING GONORRHŒA
BY INJECTIONS.

By ARTHUR E. DURHAM.

THERE is no doubt that gonorrhœa in itself is simply a local affection. And yet in the male subject it is rarely amenable to purely local treatment. Copaiba, cubebs, oil of sandal-wood, and other medicines, administered internally, are as much in vogue as ever, if not more so.

We very seldom have occasion to prescribe such remedies for gonorrhœa in the female. The disease, as a rule, is confined to parts which are easily and safely reached by injections, and over which the urine does not pass. The so-called specifics, taken by the mouth, are, therefore, neither necessary nor useful.

In the male the case is altogether different. The mucous membrane of the urethra is from time to time liable to serious irritation from the passage over it of acid urine; and the suffering part is neither easily nor always safely reached by injections as they are ordinarily used. Consequently, it is necessary, in the first place, to deprive the urine of its irritating acidity. And further, it is often deemed desirable to make the urine the medium through which remedies may be applied to the inflamed membrane over which it passes. The first-mentioned effect is produced easily enough by proper regulation of the diet and the free use of alkaline medicines. The second can only be accomplished, so far as we know, by the administration of drugs which are often very nauseous to the patient,

and are notoriously liable to disorder the stomach and more or less affect the general health. In some cases, in spite of all the skill of the prescriber and all the care of the pharmacist, these drugs cannot be tolerated in any form, and the gonorrhœa almost comes to be considered the lesser evil. On these and other grounds, which are sufficiently obvious, the local treatment of gonorrhœa by soothing astringent injections is commonly recommended and adopted. But such treatment as ordinarily carried out very often, indeed, utterly fails to do any good beyond amusing the patient until the gonorrhœa has, as it were, worn itself out.

Most surgeons of experience who have carefully watched their cases of gonorrhœa will, I think, agree that in very many instances the prescribed injections have been of little real benefit; that in some instances positive mischief has been done; and that in comparatively few cases only have good results been manifestly effected.

The explanation is obvious. In the large proportion of the cases, if not in all, in which the treatment has failed to produce any beneficial effect it will be found that the injection has not regularly reached the whole of the affected part, and perhaps even has never done so on any occasion. The injection has simply flowed round the end of the syringe, and issued from the urethra at once. It has been gently injected, and has been prevented from penetrating far enough either by the swelling of the mucous membrane or by contraction of the muscular coat of the urethra.

In the cases in which mischief appears to have been done it will generally be found that the injection has been forced too far on, or has been prevented from escaping with due readiness from the orifice of the urethra. Under such circumstances it is easy to understand how gonorrhœal matter may be carried onwards, and infect parts hitherto healthy. Thus in some cases may be explained the extension of the inflammation towards the prostate, bladder, and testicles. Instances are not uncommon in which the use of injections is followed by cessation of the discharge and a generally comfortable condition of the urethra. The gonorrhœa of the anterior portion of the mucous membrane is, in fact, temporarily cured. And yet inflammation may spread along one or other or both of the

vasa deferentia, and epididymitis or orchitis may supervene. A similar result, no doubt, occasionally happens in cases in which injections have not been used, and in which, therefore, the explanation suggested cannot hold good. But so far as my experience goes, gonorrhœal epididymitis is most frequently met with in cases in which injections have been carelessly or unskilfully used.

In the cases in which injections have manifestly proved curative it will be found, I believe, either that the inflammation has been comparatively slight, and has not extended far along the urethra—that is, not further than about an inch—or that unusual care and skill have been exercised by the patient in carrying out the directions given him, and that the directions given have been explicit and judicious.

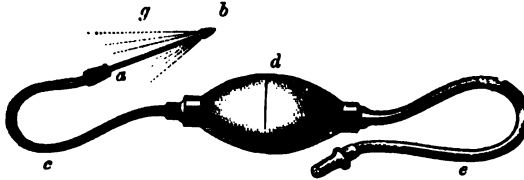
It is all but useless, and it may prove worse than useless, to prescribe an injection, and simply to tell the patient to use it so many times a day.

The directions given, I believe, by most surgeons of experience are somewhat as follows. The patient is told to insert the nozzle of the filled syringe into the urethra; to support the penis, and to press the edges of the orifice of the urethra gently against the syringe, so as to prevent the immediate escape of the injection; to compress the urethra in the perineum, or at any rate at a point beyond that to which the inflammation extends, in order to prevent the gonorrhœal matter being carried onwards; and then to inject gently until a sensation of distension of the canal is produced. The fluid thus injected is to be retained for a minute or two, and then, by the removal of the syringe, allowed to escape. This process is to be repeated several times successively.

Now, that such directions are well intentioned there can, I think, be no doubt; but as a matter of fact many patients find considerable difficulty in carrying them out. Some, indeed, have told me they considered it physically impossible to do as they had been directed. I have more than once been asked this question:—"If the right hand manipulates the syringe, and the finger and thumb of the left hand are occupied in supporting the penis and closing the orifice, how can either hand be made to compress the urethra in the perineum or elsewhere?"

With the view of rendering the treatment of gonorrhœa by injections easier, safer, and at the same time more effectual than it certainly appears to be as ordinarily practised, I devised, some long time ago, the instrument represented in Fig. 1.¹

FIG. 1.



This instrument consists of a slender tube of vulcanite (a), terminated at one extremity by an elongated bulb (b), and at the other connected by means of the elastic tube (c) with the small hand ball enema syringe (d), which is filled through the elastic tube (e). At the junction of the slender tube (a) with the commencement of the bulbous expansion is a ring of minute perforations, which are made in such direction that when the syringe is in action the fine streams of fluid ejected through them pass backwards and upwards, as indicated in the figure (g), and not straight onwards.

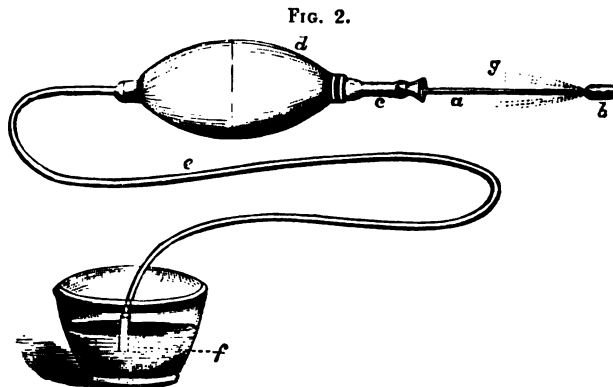
The method of using this syringe, and the principle on which it acts, require but little explanation. The heavy extremity of the tube (e) is suuk in the fluid to be injected, and the syringe is filled. The tube (a) is then introduced, well oiled, into the urethra until the bulb has passed a little beyond the point to which the inflammation is known or supposed to extend. The hand ball is then gently compressed, and the fluid issuing from the perforations flows from behind forwards, and escapes from the urethra after having safely and perfectly washed over the inflamed mucous membrane. The fluid is prevented from flowing onwards towards the bladder by the closeness with which the inner wall of the urethra becomes applied to the bulbous extremity of the tube. The stream can be kept up as long as may be considered necessary, or a different fluid may be used without the inconvenience, and perhaps pain, of removing and reintroducing the instrument. Thus, after having thoroughly washed the mucous membrane by a stream of plain water, the supply

¹ Made by Mr. Hawsley, with Mr. Baker, Holborn.

tube may be transferred to the lotion bottle, and an astringent solution applied. The outward flow may, of course, be temporarily checked, if thought desirable, by pressing the lips of the urethra against the tube; and thus the mucous membrane may be put somewhat on the stretch, and the fluid may be retained in contact with it, instead of simply washing over it.

My experience during the past two or three years, in about seventy cases, has amply proved the correctness of the principles upon which the instrument, thus briefly described, was designed to act. The results of its use have been most satisfactory.

But experience has also suggested some slight improvements on the original pattern, and has shown the great importance of attention to certain points in the construction of the instrument. I have heard of several cases of failure, and of one or two cases of some slight mischief, which have arisen from the use of faulty instruments made in imitation of that I am describing but modified by the makers without the guidance of surgical knowledge. At the risk, therefore, of seeming tedious, I venture to describe in detail, and somewhat minutely, the instrument in its improved form. The instrument, as I believe it should be made, and as it may now be obtained,¹ is pretty accurately represented in Fig. 2.



The letters of reference correspond to those in Fig. 1.

¹ Messrs. Krohne as well as Mr. Hawksley have taken great pains in carrying out my suggestions, and by them, as also by Mr. Millikin, and other makers, the instrument is now supplied.

The urethral tube (a), with its bulb (b), should be at least three inches or three inches and a half in length, otherwise the bulb cannot, as a rule, be conveniently passed thoroughly well beyond the inflamed part. The slender portion of the tube should be, according to circumstances, the size of a No. 3 or a No. 4 catheter. Many specimens of the instrument have been made far too short to be serviceable. The bulb should be olive-shaped, and about three eighths of an inch in length ; it should slope gradually and uniformly into continuity with the slender portion of the tube, and should present no sharp edge or shoulder. Any such sharp edge may cause abrasion of the mucous membrane in withdrawing the instrument. The greatest circumference of the bulb should be equal to that of a No. 7, 8, or 9 catheter. The size to be employed must depend upon the condition of the urethra at the time the instrument is used. It is easy to change one urethral tube for another, the rest of the apparatus remaining the same. A small and a large sized urethral tube may be obtained with each syringe, or the size may be selected. The largest size which will pass through the orifice of the urethra, without much difficulty or pain, should be employed. It will be recollected that the calibre of the urethra is smallest at the orifice, and consequently that the bulb which has passed through the orifice may be passed on along the canal with comparative ease. If the bulb is too small to be well grasped by the urethra, it will not so effectually prevent the onward flow of the injection towards the bladder as it should do. The portion of elastic tube (c) should be of sufficient calibre to slip easily over the urethral tube, so as to admit the changing of the tube if necessary ; it should be so short as to bring the hand ball conveniently near, and to enable the urethral tube to support the penis in the desired position. The left hand is thus left free to compress the urethra whenever needful.

The facility with which this instrument can be used, and the thorough and effectual manner in which by means of it the urethra can be washed out, are sufficiently obvious. Theoretically, it appears to afford a ready method of treating gonorrhœa on scientific principles. Practically, as I have said, it has been already proved to be of very great utility. And I have no

doubt that further experience will still more fully establish its value.

It may be used with advantage, I believe, in almost any stage of the malady. But its use is obviously most appropriate in the earlier and the later stages.

During the acute stage, when the mucous membrane is much swollen and excessively tender, the introduction of the instrument may be too difficult and painful. But from my small experience of its use in this stage I am inclined to believe that if only the introduction of the instrument can be accomplished there is no stage of the malady in which more speedy and obvious benefit is obtained. In gonorrhœal ophthalmia, the more acute the inflammation the greater the need for the continuous washing away of the matter and the application of appropriate remedies; and the more evident, too, is the beneficial effect. In urethral gonorrhœa the conditions are sufficiently similar to indicate similar need, and the probability of similar good result. The old method of injection is absolutely inapplicable, because the fluid cannot be injected far enough, or, if injected, is certain to carry on the infectious matter and spread the mischief. Besides, the repeated introduction and withdrawal of the nozzle of the syringe, which are necessary, cause repetitions of severe pain to the most tender part of the urethra. But in the method I am advocating, when once the bulb of this instrument is fairly passed beyond the inflamed portion of the mucous membrane, little or no pain is occasioned, and the gentle continuous current of tepid water or soothing injection which can be kept up is most pleasant to the patient, and directly beneficial to the suffering part.

In the earlier and later stages of the malady—that is to say, before the acute stage is reached and after it has subsided—the introduction of the instrument is easy; and, as a rule, the good effects of its use soon become manifest.

I have been assured by several patients whose personal experience in gonorrhœa has been considerable that the disease has been absolutely cut short and prevented from becoming established by the free use of mild astringent washes as soon as the first threatening indications have shown themselves.

I have seen many cases in which the disease has been cured

in from ten days to three weeks without the supervention of any acute symptoms.

I have also seen many cases in which, after the acute stage has been passed, the cure has been completed in a comparatively short space of time—in some instances in the course of a few days,—and that without the internal administration of any of the so-called specifics.

It is unnecessary to dwell upon the obvious fact that, if the inflammation has extended along the urethra beyond the point to which the tube can be passed, it is not to be expected that the use of the instrument can effect, although it may aid, the cure.

The stage of the malady and the condition of the urethra must determine the nature of the solution it is best to employ. In every case, however, before using any solution it is best to wash out the urethra thoroughly by a stream of tepid water, and the injection should always be practised immediately after urine has been passed.

If the urethra is but little irritable, as in the earliest and the later stages, astringent solutions may be employed with the greatest advantage. But these solutions should not be too strong. One to two grains of alum, or two to four grains of sulphate of zinc, or a quarter of a grain to a grain of chloride of zinc, or the same proportion of nitrate of silver to an ounce of water, will, I think, be found to constitute solutions of sufficient strength. Continuous washing with a weak solution is better, as a rule, than a short application of a stronger one. If the urethra is very irritable a solution of acetate of lead, with a small quantity of acetate of morphia or extract of belladonna, is useful. It seems to me very probable that a lotion containing copaiba in suspension might prove very applicable in some cases. But I have not yet had sufficient experience on this point to enable me to make any decided statement.

It is unnecessary to enter upon the discussion of the general treatment and management of patients suffering from gonorrhœa. My object in the present communication has been simply to describe and recommend a method of local treatment which at one period or other in the course of this troublesome malady is likely, I believe, to prove of service, at any rate in a very large proportion of cases.

It would not be right to conclude without stating that many years ago Mr. Hilton devised and recommended a syringe having a long nozzle terminated by a bulbous extremity. His object was to a certain extent similar to that which I had in view in designing the instrument I have described.

I venture to believe, however, that my instrument possesses advantages which are peculiarly its own, and that, used in the method above recommended, it will be found of considerable service in the treatment of this common and often very troublesome malady.

ON THE NECESSITY
FOR A
CLINICAL NOMENCLATURE OF DISEASE.

By W. MOXON, M.D.

WHAT is a disease? In defining disease we doctors are not so strong as the general public. These know practically what they mean by it. They mean the *unease*, the *disturbance*, the pain or danger, that they suffer. We doctors, on our side, look upon all their miseries as symptoms, and think these only the indications of the real disease which is the cause of them, and, with this view, we aim to combat, not their felt diseases, which to us are only signs, but some underlying cause that may be of an entirely different kind and which we regard as the disease. Now, in this way, arises a very significant divergence between the doctor's view of a disease and his patient's view of the same. Indeed, one easily sees that the torments which absorb all the attention of the patient may be very lightly estimated by the doctor, who is bending all his faculties upon the anatomical changes which are at the bottom of the malady, as he thinks. Plainly, too, we may see that the general public, under these circumstances, quick to discern where its necessities are not responded to, still enforces its demand for assuagement of and sympathy with its immediate sufferings; and as demands of the general public in turn create supply, the needed assuagements circulate freely under the form of patent medicines, while the sympathy is very remuneratively supplied by a class of doctors whose learning and diagnostic skill need range little above those of quacks.

I believe it is very important that those who have the care of the general welfare and usefulness of our profession should

clearly recognise the strong and growing tendency in the medical art to diverge from the want it is intended to supply. The antagonism between the patient's view of disease and the doctor's view of disease is the very vital breath of our parasites, the "opathsies" which, like all parasites, flourish on account of the unsuitability of their victim to its circumstances, and so are sure signs by whose presence and increase we may learn and measure our maladaptation.

What is in a name? Whoever will answer that question will vastly enlighten the science of human nature. He will discover the secret of human power. Certainly, he who asks that question with the thought of sneering at the importance of names is vastly out of his reckoning in his account of their weight. Every thought in the mind's unconscious memory is brought to light by its name. It seems to come into consciousness by means of its name. The name is a mark or token which brings into the mind a conception of the thing on which it is imposed. Without the use of names we should be, as Hobbes quaintly says, like "such brute beasts, which, having the providence to hide the remains and superfluity of their meat, do, nevertheless, want the remembrance of the place where they hid it, and thereby make no benefit thereof in their hunger."

Those who ask contemptuously "What's in a name?" are referring too much to the selfish side of the profit their question concerns. To the individual mind names are only the marks by which it notes the things that it has cognisance of, and true it is that for the one mind's own part only the cognisance is vastly of more moment than the name that marks it, and the name is apt to seem, even upon some reflection, to be something adventitious, and not necessary to the cognisance, and so a matter of secondary or even trifling importance when compared with the cognisance. Yet are names the machinery of consecutive thought. The name gives purchase from which thought can take fresh leverage. But it is when the import of names is considered in reference to communication between mind and mind, that their importance is seen to assume its true value.

However well the single mind might know things independently of names, the knowledge cannot pass from mind to

mind except through the means of names, so that names govern and measure the communicable knowledge of any subject. When two persons are comparing their experience of similar things, they succeed well in their attempts at comparison according as terms rise to their minds which mark the idea that they wish to express, and which they agree in attaching the same meaning to.

I want especially to insist upon the incalculable benefit in point of clearness and prominence which any subject of possible thought and discourse acquires by having a name. The existence of this name is at once the proof and the means of the usefulness of the subject in question. The proof, inasmuch as the name for it would not exist if it were not of importance to men in their mutual relations; and the means, because without a name the subject could not be easily and directly conveyed from mind to mind.

Names and their meanings are the signs of public knowledge and interest, and the application of suitable names is an important means of adverting and fixing attention to any neglected subject of inquiry.

A name challenges the learning of those who profess or desire to know such a subject. To realise the view of the subject which has suggested the name, inquirers are compelled to consider it from a point of view like that which is the ground of the name; and when many minds are brought so to view the subject, some will throw new light upon it—all will benefit by the light so thrown.

This social function of names is like the function which names discharge in the machinery of our individual minds. Between mind and mind the name creates for the subject of mutual reflection an identity that can catch and hold the mutual attention of the several minds; just as in the single mind a name holds steady in its place, so to speak, any subject of thought. And as it is true that no subject of reflection will, in one's own mind, take its place in a chain of thought unless it is identified and moulded into a name, so it is true that no subject worthy of public interest will take its position in public inquiry and knowledge unless it is likewise coined into and identified with a name.

It cannot be too clearly and forcibly held before all minds

that the *function of names is to govern attention*. Hence the power of oratory ; but also hence far more the power of silent "common-sense" reflection of many people on any subject identified with a name.

The creation of suitable names, then, for matters of practical public importance, is a very momentous necessity. It is obligatory on us, to the best of our power, to make and have a machinery for clearly and quickly communicating what concerns the public good.

And on the other hand, it is a serious failing in our function if the names that we create to fix and embody public attention are insufficient or unsuitable, or redundant ; because if insufficient, some matter of public interest will languish for want of attention ; if unsuitable, the very numerous yet important majority of the community, whose understanding of the subject is not free from the risk of being misled by other relations or applications of the name, will be seduced into error regarding it, or so confused as to lose interest in it. If redundant, then the always more or less narrowly limited margin of attention which each of us has to devote to subjects of general interest will be wasted on those fruitless sides of the subject, or unimportant trifles in it, on which such redundant names are bestowed.

When we are dealing with the public or social functions of names we must keep in view the distinction between a science nomenclature and an *art* nomenclature. The aim of a science is the increasing and unlimited knowledge of the things it concerns itself with ; a science seeks out and names with no other object than to know. The scope of any art is, on the contrary, limited and prescribed ; it has its proper sphere of work, and it must borrow from the nomenclature of the sciences which it rests upon such names only as are useful for its practical purposes. Two opposite principles, then, must govern the construction of a nomenclature for use in an art, such as that of medicine. These principles are,

First—

That every subject which it is important that the followers of the art should be able to mutually recognise, or to communicate to each other, should be embodied in a distinct and suitable name.

Second—

That names should not be introduced into the nomenclature of the art except on account of their application to subjects of practical importance in the purposes of the art.

Another and a very obvious principle is, that the names adopted should be so far carefully chosen that they may not contradict or misrepresent the actual facts of the subjects to which they are applied.

Let us use these principles in the examination of the nomenclature issued by the Royal College of Physicians. No question can be of greater interest to the profession than the question whether this nomenclature is a good and sound one—nay, is the best and soundest, and the most promising for advancing the usefulness of our art, that could be devised. I think it is not so, and that it requires modifications, not in detail only, but in plan and principle, before it can confer on us the benefits which a good system of names for diseases would bring with it.

It is not necessary, nor is it possible, to bring the whole nomenclature under a detailed review; what I have to say upon it will be sufficiently brought out if I take the system of names adopted by the College for diseases of some particular organ—say the kidney.

The list of diseases of the kidney which is given us is very little more than an enumeration of the anatomical changes which the kidney undergoes primarily in its own proper diseases, or secondarily in diseases of other organs.

And two things are, I think, true concerning the list. First, that as an enumeration of anatomical changes it is redundant, incomplete, and otherwise incorrect. Second, that the scope and aim of it is wanting in a most important branch of usefulness.

First, as an enumeration it is incorrect. Thus—

No. 538, Bright's Disease, is made to include fatty kidney as a form of the chronic division of Bright's disease. Now, it is fully admitted by general agreement that fatty kidney has really no connection with Bright's disease. The kidney is loaded with fat in most cases of diabetes, in poisoning by phosphorus, in acute atrophy of the liver, and in

some cases of obesity, and also sometimes accidentally or under unknown conditions. But in these cases there is generally no albumen in the urine. This fattiness of the kidney, like fattiness of the liver, is, as a rule, found without any sign whatever of derangement of the functions of the organ, certainly it has no connexion with albuminuria.

It is true that many cases of the later stages of epithelial nephritis (i.e. tubal or desquamative nephritis) show some fat unequally distributed in the tubes, but the whole history of this miserable disease clearly shows that the fat here is a secondary and unimportant, nay, trifling condition, an effect and not a cause of the morbid process, and by no means so constant or so regular an effect as to be even a measure of the degree of disease.

The subdivision of Bright's disease according to the state of the kidney is now always on this plan :

1st, a disease affecting the epithelium, which may be acute or chronic.

2nd, the granular kidney, a disease affecting the stroma of the kidney.

3rd, the lardaceous kidney, affecting the small vessels primarily.

No one places the fatty kidney in company with these.

This is certainly not an unimportant error. I recently saw some reports of inspections of surgical cases in which nearly every kidney was said to be fatty. Now, if this were taken to mean that so many of the persons who died of their injuries had got chronic Bright's disease, very important and erroneous conclusions would have been drawn from the experience. But I myself saw some of these kidneys, and certainly very few of them contained any fat at all, while even these contained it only in the shape of a little store-fat. There was no trace or suspicion of Bright's disease. I mention the error in the judgment of the state of the kidneys as illustrating a point which in the nomenclature appears to be quite ignored, viz. the danger that arises in trusting for the determination of a disease to the morbid anatomy of organs, when the observer, though a very competent and well-educated practitioner, has not had special experience to enable him to form a correct opinion of the state of diseased organs.

One other point is worthy of mention in question of correctness and completeness, and that is No. 49¹, tubercle of the Kidney. 49¹ refers only to "scrofulous inflammation." Now, morbid anatomists are familiar with two distinct kinds of tubercular disease of the kidney which have scarcely any practical relation to each other. First, the miliary tubercle, which is found in the kidney in cases of general tuberculosis, and which is generally unimportant, though it in some cases appears to cause albuminuria among the other symptoms of general tubercle. Secondly, the destructive scrofulous, chronic inflammation of the kidney which is the condition No. 49¹ refers to. The nomenclature is so elaborate on other points that to overlook this one becomes anomalous.

Again, as to redundancy. Certainly No. 545 Atrophy, unless as Granular Atrophy, which comes under 538, or as Hydronephrosis, 543, has no possible value in a nomenclature of disease. There are no other renal atrophies that can be called diseases. Once more, 547, Simple Cyst, surely is no way to be called a disease. A simple cyst in the kidney is not attended with any symptoms or with any danger. On the other hand, the great *compound* cystic kidney is altogether omitted from the list, although it is a very remarkable and peculiar disease, and one which, when seen for the first time, is sure to astonish the observer. This compound cystic kidney should have been made a variety of chronic Bright's disease. As a last specimen showing a want of clearness I will take No. 539, Suppurative Nephritis, defined as being "inflammation with suppuration of the substance of the kidney;" No. 540, Abscess; and No. 49¹, Tubercle (scrofulous inflammation). Now, I confess I cannot see how one is to distinguish a set of cases of abscess from those of suppurative nephritis on the one hand and scrofulous inflammation on the other, and I cannot conceive why any one should be called upon to try and make such a distinction.

I would beg to be allowed to say I have not made these criticisms with the foolish intention of affirming a superior correctness to that of the distinguished men who have drawn up the nomenclature. My object is to point out, that one engaged, as I am daily, in the close observation of morbid anatomy, varies from the doctrine of the nomenclature so

much that it would be of little or no use to him, notwithstanding that the basis of the nomenclature is morbid anatomy.

And, indeed, I believe that the facts of morbid anatomy, stable and certain as they at first sight appear, because they are matters of direct observation, are very subject to opposite and doubtful interpretations, while the difficulty of classifying them is increased from the prevalence of temporary and intermediate conditions.

Further, every one who has any experience of the matter knows well what a long course of special training is required before a man can become familiar with the numerous changes in morbid anatomy, so as to be able to give a reliable opinion on the subject.

In truth, if we make due account of this need of special skill, which so few have time to acquire, yet which is so necessary in order to refer a morbid change to its place in the nomenclature which the college has given us, and also make due account of the variance in the views of morbid anatomists as to the nature and relations of the anatomical changes that are so minutely detailed in the nomenclature, one can scarcely avoid the entrance of a wonder whom it is likely to be of use to. For a professed pathologist it is not so accurate nor so full as a good work on morbid anatomy, while it calls for so wide and practical a knowledge of that science on the part of the writer that very few general practitioners will be able and willing to follow it.

But besides these imperfections of the nomenclature of kidney diseases, which will be very difficult to cure so as to make it such a list of the anatomical changes that occur in the organ as will satisfy everybody, there is another want in it which it is my chief object to enforce, namely, the entire want of terms to express the clinical aspect of kidney disease. Surely we ought to have some guidance in expressing the connections which we all agree in finding between albuminuria and its various secondary affections, and some guidance in naming the symptoms of cases whose morbid anatomy we have not yet seen. Can it be right to assume that the practitioner is able to get a post-mortem examination of his case so as to be able to see and handle the organs and judge of their state? How few of all cases are thus cleared up! In nearly all cases that occur

in private and union practice there is no post-mortem examination.

How, then, is one to name the disease on this anatomical system? Let us take an instance. There must always be many cases in which some internal suppuration exists in or about the urinary passages communicating with their channel, yet where nobody can know what the seat and source of suppuration is. Where are such cases to be put? The college does not give us such a word as Pyuria, which would express the clinical nature of the case. A very large proportion of cases must come in this way to be incapable of registration unless the practitioner guesses his way to the conclusion that some one or other of the diseases of the kidney, &c., which produce pus was present in the particular case, and in his guess he may be altogether wrong.

The college gives us a considerable number of names of individual symptoms. But they are put in the lowest place instead of being made to be the chief importance, and giving a clinical character to the nomenclature as they should. We want to have the names of diseases made to refer primarily and chiefly to their clinical nature; and, secondly, to have an arrangement introduced such that the nature of a disease may be accurately defined apart from its anatomical results; and, thirdly and chiefly, that the nomenclature shall correspond to the actual clinical grouping of the symptoms of disease rather than to the anatomical or physiological divisions of the body and its functions. Such a nomenclature would aid and further the recognition of the natural clinical associations, dependencies, and mutual relations of the vital factors of disease.

It is especially this third desideratum which we should try to secure. We want a clinical nomenclature. We want aid in our clinical labours from the vast power of names which I have endeavoured to urge in the first part of this paper.

None of the anatomical changes are diseases. They are the causes of diseases or the results of diseases. The disease is the subjective thing—that which he suffers. It is better to see it in this light, and it can be clearly seen so. When I go to my doctor it is my feeling of suffering and incapacity, of privation and of danger, which I want him to recognise and relieve. Those sufferings and incapacities he can recognise in

me as I am, and should be viewing them as he treats me. He should not have his mind set on doubtful changes in my anatomy except when I need surgical relief. Why should we put off our naming of the disease until after the death of its sufferer? To say "We shall see what it is at his post-mortem" is absurd and cruel.

The College has given us a *science-of-anatomy nomenclature* when we want an *art-of-medicine nomenclature*. We must set ourselves to construct a good nomenclature for the diseases that our living patients have. We want that, and must have it, in the practice of our profession as an art: and we want it now, while we are trying to recognise and treat our cases. We cannot afford to wait until the profession has learnt and taught us to discover a great deal more than we yet know about the anatomy of our patients. *We want the means of fixing mutual attention on what our clinical experience shows us.* We see that the morbid-anatomy nomenclature is of dubious value and of doubtful application; and even if it were so complete and easily applicable up to our present knowledge of organs and functions we do not want in the medical art a mere list of names founded on the organs and functions which we suppose ourselves to know. We do not know the functions of the spleen, thyroid, tonsils, thymus, supra-renal capsules, nor half the functions of the liver or of the several parts of the nervous system; and no doubt we do not know rightly what we think we know, and we cannot estimate the weight of what we do not know. Why, then, should we presume to divide *all* the diseases by less than half a knowledge of the machinery they affect? The nomenclature of morbid anatomy is very good for the science of morbid anatomy, and I should be the last to undervalue it. But we want for the medical art a nomenclature that shall name diseases as we find them in nature, founded on the direct and comprehensive observation of the individual patients, and not on bottles of dead livers and kidneys. We see that a morbid-anatomy nomenclature has not even the advantage of completeness. Many diseases do not find a place in it. It shows, after all, only the dead side of disease. Why should we look most fixedly on the dead side?

The women have named many diseases for us, and their names make some of our best names. Their names follow a leading symptom. We want names that shall bring the chief

symptoms into prominence, and give us means of arranging the occasional or secondary symptoms around the leading symptoms. If we so named what we meet in the living, we could compare our observations and experiences together as we now cannot. If we name only what we at the bedside seek to know as anatomy, or believe in as an anatomical change, we only compare our beliefs, and these, themselves doubtfully drawn from doubtful observations, are too vague for comparison unless we cast them into terms that their laxity in precision will not warrant.

The hackneyed newspaper-worn saying, "that an exact diagnosis is a first and a necessary step to a successful treatment," is certainly not true if it is taken to mean that we must accurately know every detail of tissue change, and this is the sense in which it is often used. It is correct only when it is taken to mean that we must accurately know *of what kind the case is in regard of the medical art*. In other words, we must recognise the true nature of the case, as calling for a certain method of treatment. It is so absurd as to be scarcely candid to keep repeating a statement intended to mean that exact and minute knowledge of the changes that have occurred in a process of disease is needed in order to its cure. This certainly is not true. The evidences of its untruth are decisive and are of two complementary sorts. Firstly, it is true that our best cures are worked in cases where we know nothing of the details of alterations of structure, or where such alterations are scarcely alluded to in our morbid anatomies. Take as instances ague, skin diseases, nerve diseases (bromide of potassium), syphilitic inflammations and gummata, &c. In none of these instances has success in practice any relation to minuteness and detail in the knowledge of structure of the lesions. All that is needed as to the lesions is that the practitioner shall *know enough of their characters to recognise them*.

Secondly, it is true that minute knowledge of diseased changes does not lead to any indication for medical treatment; for this, I believe, may be laid down as the result of therapeutics directed to the relief of anatomical change—that *there is no medical remedy for anatomical change*; in other words, *the knowledge, ever so minute, of anatomical change in structures does not furnish us with any power of treating it medically*

other than those which we possessed when our knowledge was only enough for the recognition of the disease. To carry thus minutely the science of morbid changes into the art of medicine is as though, in the breeding of cattle, people should make a study of their testicles and ovaries.

Now, in trying to discover anatomical changes the interest that a physician has in his case is diverted to the anatomical aspect of the case. And yet, when he has discovered the anatomy, he is faced by a thing which he has no means to cope with. Changed anatomy holds out no hope to him who is to treat by drugs.

In the mean time there are in every case some characters which are not anatomical, and only indirectly connected with the anatomical changes, but which yet greatly modify the course of the disease, and often point out the means best adapted to its relief. Temperaments, diatheses, states of weakness, either habitual or temporary, in some of the great vital organs, are among states that practised observation can make the observer able with certainty to recognise; and whereas the changed anatomy of the principal lesion is not to be reached by medicines, yet disturbed functions, whether of the affected part or other organs, which arise out of the peculiarities of the individual in his vital processes, may be increased, checked or altered.

To what end, then, is it desirable to know anatomical changes? Certainly when we possess the power, and intend to employ the power, of altering these by direct operative or manipulative interference.

This is where surgery is required to step in. The surgeon must make a diagnosis. He must know the diseased anatomy through and thoroughly. For his purpose the knowledge of the actual state is imperative.

Herein is the natural divergence of medicine from surgery; on this account they separate because they have opposite aims. *Surgery* seeks to know the actual condition of the individual part, that it may take advantage of whatever promises to admit of operative relief. *Medicine* seeks rather to know which of the kinds of disorder the particular disorder before us corresponds to, in order that the methods of cure most approved by experience in similar cases may be employed. It looks rather to the unchanged remainder than to the changed part.

If medicine seeks to precisely localise the anatomical change, and to discern its kind, it forgets its proper aim. Its proper aim is to recognise and act upon what is now knowable before it in the patient—to consider the strength and weakness of the action of every organ in the patient's frame, so as to discover the kind of his living agencies, wherein they favour and wherein they oppose his progress to health. It must look the whole man all over, and the differences in its plans of treatment must respond to differences in the plan of the vital processes and living changes in patients, and not to differences in the anatomical alterations caused by or accompanying those vital processes. This circumspection of the patient, or, if I may invent a word, *Perignosis*, is what we want to cultivate in medicine, rather than the penetrating—*Diagnosis*—which concentrates attention through to the knowledge of the local change. Such diagnosis is only needed for surgery.

I am not denying the interest which attaches to the diagnostic study of cases of medical disease. Nor do I undervalue the importance of it in many cases. It is most important that the physician be able to recognise extensive effusions of liquid in the great cavities: but why is this? Is it not because these may require paracentesis? Because the surgeon's office may be called upon? If we study books on diagnostic clinical medicine, such as Dr. Gairdner's, it will be seen that the practical issue and interest of the precise knowledge that is so ably searched out is limited almost entirely to the question whether paracentesis is or is not called for—which is really a surgical question.

Now, if this be a true view of the aim and office of medicine, I ask whether it is right that the names of medical diseases should be names got out of morbid anatomy, seeing that with the names go the social interest and our power of communication of experience one to another?

Is it not a worthy and important aim to give names to medical diseases that bring into prominence their vital characters, so that the symptom that is most prominent shall found the generic name, and the symptoms that importantly alter the course of the disease shall determine the trivial qualifying names?

I believe that the prevalent scepticism as to the powers of remedies in relief of patients arises from the habit that has arisen of identifying the morbid anatomy of disease with the disease itself, and I believe that the naming of diseases from their morbid anatomy is a very important cause of this unfortunate confusion of morbid anatomy and disease. Therefore I wish to express my regret that the College of Physicians should have adopted so purely anatomical a system of nomenclature.

It would be a vast advantage to us in the practice of medicine if the system of names, and with it the main direction of social attention, could be made to bring in our patient prominently forward *what the nature of his case is in its aspect to medical relief*. Whenever a man has a local disease, two distinct systems of means our profession offers for his cure. The first and most direct of these is the system of manipulative means. These act for removal of topical changes. The second is the system of remedies whose object is to affect the part by vital changes in the general state of the organism. The first set of means devotes its regard to the part. The other regards the part only in its relation to the whole system of the man.

The first set of means constitutes surgery, and aims directly to remove the particular alterations already effected. The second set constitutes medicine, and treats the general system, aiming to prevent and counterbalance such changes. The exceptions to this view of medicine and surgery are rather apparent than real. When, for instance, it is urged that the surgeon treats cutaneous eruptions without chief regard to topical means and topical changes, as in syphilitic eruptions, or those dependent on general depraved nutrition, this only means that the surgeon has to take then a medical view of his case—he acts towards such case as a physician. Syphilitic disease and bad legs are, indeed, practically often enough put under the care of the physician, and I believe are just as well managed by him. On my principle, stated above, the physician ought to have the care of syphilis and of many sores. And when, on the other hand, the physician has to blister his obstinate rheumatic joints or tap the chest, &c., this only means that at the time he has to act as a surgeon, or call in

id of one. The topical or surgical relief has become the important. Now, to the surgeon, whose interest is in the relations of the local change, an anatomical nomenclature is most desirable: it best harmonises with his aims and is of cure. But to the physician, whose interest is in the general relations of the local change, a nomenclature that should embody, or at least touch upon and have reference to, the general relations would be most desirable.

This is a radical distinction, and should not be lost sight of, although the division of the fields of practice into medicine and surgery respectively may not be able to follow exactly the line, yet I believe that it is the only distinguishable line between medicine and surgery, and it corresponds with the position in habit of mind and in tendency of practice in the two great branches of the profession.

Is it not true that the anatomical nomenclature conforms to surgical therapeutics? And is it not true that the anatomical nomenclature of disease is an impediment to medical therapeutics? So that the lecturer on therapeutics can only affirm the actions of his remedies on the morbid changes that are brought to his hearers' minds by names that are drawn from post-mortem tables. To cultivate therapeutics with spirit and success, do we not want to set our minds on living processes?

The nomenclature of the Royal College of Physicians makes no distinction between the surgical and medical, the local and general, the accomplished and current aspects of disease. We look to the college for a set of names that shall apply with certainty and practical precision applicable to all clinical cases, without post-mortem examination. We need, we must have, names that will tell us how to describe and speak of cases that are really cancer, or aneurism, or neuralgia of the prevertebral tissues, when we do not know, and cannot say, which of these states is present. And even when we can certainly diagnose the state, why should we be obliged to say mainly what is hopelessly damaged, all the while we are trying to carry on what yet remains unhurt, setting our hands on dead change with the object of influencing life? Why do we devote ourselves to the fates, while we yet may have hope in the gods?

Names of symptoms we have, though not enough of these. But what we require are good names for the *clinical groups of symptoms*, names that will carry with them the therapeutically relievable side of our cases if possible, or whether or not will put them to us living and hopeful, that we may be encouraged to watch eagerly all the influences at work for and against the patient. Names, that is, of actions rather than of states, names that bring to mind those conditions and operations of the vital organs which favour or disfavour the recovery of the patient. All these states of function of the great organs on which recovery or death depends are lost out of sight on the post-mortem table, and out of mind in its language. The autopsy rarely tells us why the disease was fatal in that particular case and at that particular time, which is what, as physicians, we want to know. Cannot we name the clinical differences in the same anatomical disease? Every one soon learns that the same anatomical disease will clinically run through the most diverse course in different individuals, and in clinical lectures we hear that these differences in the course of the same anatomical disease, founded on weakness or strength of different functions in different individuals, are the signs to guide our prognosis and treatment of the individual case. Yet these all important variations of character are left to vague language, that cannot hold them up from oblivion. We centre our regard on the anatomical change, we name it, and so pivot our knowledge of the cases in which that change occurs upon the change chiefly or only. And those important varieties of the group of cases which we can address with our remedies are left without terms by which to write them in our memories and communicate them to others. Hence the difficulty there is in conveying in clinical instruction the lifelong experience which has grown up many-headed, but nameless, in the mind. Hence, every one has to learn for himself all that is practical in therapeutics, and gets from his modern teachers only the means of detecting dead changes, and a scepticism of the power of living influence which his teachers do not suffer under. For the teacher has seen what the learner has not seen, he has seen the good effects of management of the peculiarities of different people suffering under the same anatomical change, but he cannot convey this knowledge to his

upil because his profession gives him no names to utter such knowledge with.

Let me illustrate my meaning by an example. We will take five cases of heart disease, and one of them shall have mitral regurgitation, another aortic regurgitation, another pericardial adhesion, another dilated hypertrophy, and another disease of the pulmonary valves. We might increase the list of five greatly, but let them suffice. Now, the college nomenclature of diseases would instruct us to call these by the names of the several lesions, and indeed in any hospital they would, no doubt, be named according to the several conditions present, that is, as far as these could be discovered. No doubt the pericardial adhesion would not be found out, as I never see it diagnosed. Now, practical physicians must admit that the treatment of these five cases does not depend at all on the nature of the lesion that so determines the name and classification of the case. It makes no difference what the lesion at the heart is as to the question of treatment. To all intents and purposes for clinical management, heart cases, *so far as the heart is concerned*, might be divided into obstructive and ulcerative. On the other hand, it does make a vast difference, no doubt much greater than we suppose, what is the general state of the sufferer and what the power of his several organs. Thus, a cardiac obstruction with a certain unnamed cachectic state that is apt to accompany or arise from the heart disease is a very different thing from the same obstruction without the cachexia. Then in one patient the tendency is to jaundice before dropsy, in another the kidneys fail early, in another cerebral suffering prevails, in another the lungs suffer exceptionally, according to the relative degrees of perfection of the organization or of vulnerability of these several organs. The cardiac obstruction, like heat in a fractional distillation, only reveals the capacity for disturbance which the several constituents of the body possess.

Now, the College of Physicians gives us no terms to fix our experience of the cardiac cachexia, and no terms whereby to compare our observations of success or failure in managing the icterose, albuminuric, the plethoric or anæmic varieties of clinical heart cases. Such a list of heart "diseases" as the College of Physicians gives would do honour to a college of

morbid anatomists, but surely that side of our knowledge of heart cases that brings us into view of the living sufferer and his symptoms should outweigh with the physicians the curiosities of morbid anatomy ; or at least, if the anatomical list is necessary, can we not in the next edition have some names that shall denote for us something more of the patients than the incidental causes of the mechanical obstruction ? For surely this mechanical obstruction itself can scarcely claim to be admitted as a disease. (Trousseau denies it the name.) How much less the chance item that causes it. *Clinical* cardiac disease is made up of the *weaknesses elicited* by the obstruction. Surely it is possible to set our knowledge of this important class of cases more to their clinical aspect. Would not a good system of names referring to clinical differences bring out much valuable experience of the management of the several clinical sorts of case ? Otherwise we might as well be physicians to the post-mortem table.

Let us take an example on the opposite side—one that will — show how great an advantage to clinical medical study is gained — by clinical names. Let us ask whether has most good been — done to the study of diseases of the spinal cord by the attempt — to note them as myelitis and meningitis in the various regions, — or by the method, recently so ably practised by Duchenne of — Boulogne, of arranging and naming them by their clinical — phenomena. Is it not true that the anatomical method of the — last forty years had caused tabes dorsalis, which was formerly — well known, to be lost sight of by the profession, so that — Duchenne had to rediscover it and name it again by its present — awkward name, locomotor ataxia ? By what anatomical study — would the recognition of glosso-laryngeal paralysis as a real — species of disease have been effected ? If a man comes before — me with staggering gait and contracted pupils, complaining — of weakness in the legs with shooting pains in them, and — constriction round his body, and says he cannot stand in the — dark or with his eyes shut, I am able to recognise his disease — as locomotor ataxia (or tabes dorsalis as I prefer to say), and — can also infer that he has grey degeneration of the posterior — columns and posterior roots of the nerves of the spinal cord. — Here I make two distinct inferences, which are different in — kind.

The first inference, which I call *perignosis*, is that the case before me stands in a certain known clinical group of cases.

The second inference, which I call *diagnosis*, is that the case as it stands before me is founded upon certain anatomical alterations.

The first kind of inference has the advantage of being able to be made with absolute certainty. I can as certainly determine whether the symptoms of my patient are those of *tabes dorsalis* as I can determine whether a flower that is offered me has the characters of the *Cruciferae* or not. It is this kind of inference which I complain that the Nomenclature does not give us more encouragement in forming. The second kind of inference cannot always be made; even in the case of *tabes dorsalis* it is not certainly correct, for sometimes the group of symptoms that make this disease are found when there is no change in the posterior columns of the cord.

Again, many diseases stand in respect to *diagnostic* recognition in a far worse position than *tabes dorsalis*. Thus, to take another instance, if a man is brought to me with motionless limbs, retaining sensibility, and with full control over his excretions, a knowledge of the anatomical change then and there, as the patient is before me for treatment or for discourse, I cannot have. It is not possible to do more than guess what, in this sense, is the matter with him.

But I can know what phenomena he shows, as I can in the case of *tabes dorsalis*. The first form of inference could be drawn by me without interfering with my power to draw the second if I am otherwise able, and I could say that the case is —, only that our professional language does not offer me any name that will describe that group of symptoms. I can call it—I must call it—paraplegia, but that is a very wide term, of most vague application, and would equally apply if the symptoms were very different. Following the genius of the time in the spirit of the College Nomenclature, I must seek to say “softening” or grey degeneration or tumour, fixing my attention towards the anatomical change which I shall only know P.M. So that I buzz round my patient with the words of my mouth guiding the meditations of my heart to his autopsy. Now, what I want to know is, why I cannot have from the great authorities in medicine a name that would

set in my mind this frequent group of symptoms to use *at the time when I don't and can't know whether it is softening or anything else the matter with the cord, or even if I never shall know what is the change in the cord*—to use, that is, when I am treating the case. I recently had such a case, and it slowly recovered, and I don't know the case diagnostically, and can tell other people about it only through the coarse name "paraplegia," which means a deal more and a deal less. I often want to mention the case, and to do so am obliged to go over all the symptoms, while my audience, like all Englishmen, are impatient at the many words I am obliged to use.

Another point to which I cannot do more than allude is the absence of the important element of causation in the system of names which the college has authorised. If we were to follow that part of Cullen's system which names the specific divisions of diseases according to their causes, the attention of all would be constantly held to the consideration of the causes of diseases. The specific name of any disease, if it implied a cause, would solicit from the certifying practitioner who wished to use it a belief in some definite cause of the disease in point. And so a certain pressure would be put upon all, directing them to the study of the determining causes of diseases. Would not this probably bring out a mass of evidence, including the beliefs of practical and experienced men, as to the sources of disease? It is true that much of this might be ill-founded, *but I believe that the correctness of a practitioner's opinion of the cause of his patient's disease will generally compare very favorably with his knowledge of its anatomy*, and certainly has a much more direct bearing on the management of it. By a plan in which the leading symptoms determined the generic name of the disease, and the cause gave the specific name, certainty of recognition would be acquired and beliefs as to causation would be compared and confirmed.

Would kinds of disease determined by symptoms correspond to kinds of disease determined by morbid anatomy? Certainly not in all cases. But, as it appears to me, this is cogent reason why morbid anatomy should not be taken as the basis of classification of kinds of disease. For we have to cure symptoms, and not morbid anatomy, except as surgeons, and

I certainly know no reason to believe that a given group of symptoms that occur "functionally," or without evident anatomical cause, are more benefited by a given treatment than the same group of symptoms when they have an anatomical cause. It is true that when an anatomical change of an irremediable nature causes a set of symptoms the effort at removing these symptoms is less hopeful, but, nevertheless, I believe it is a general rule that symptoms so caused are most likely to be relieved by remedies that cure the same symptoms when they are due to "functional" states only. So that if we exclude manipulative (surgical) treatment of anatomic changes, and confine our attention to medical diseases proper, that is, to diseases that are not susceptible of operative relief, and in which we have to cure by addressing ourselves to the power of the undiseased remainder of the body, and not to the diseased part, then I believe I may say that the anatomical change is better left out of account in managing the case.

For I believe that if we get into the habit of looking for and to irremediable anatomic changes at the bedside, we are apt to fail in using an activity of treatment in more hopeful cases. At the same time that, in truth, if viewing even these cases of irremediable change from the vital side as symptoms, we should, by actively endeavouring to relieve these symptoms as though they had no such irremediable cause, do much to lighten the suffering of our patients.

A general and public experience of the results of treatment on symptoms and groups of symptoms we do not possess, because always of late years every one sets his mind on the anatomic change and not on the symptoms in treating diseases. Hence I believe that therapeutics have not had a fair trial. And if at present we have private belief and public scepticism in our remedies, I believe this is because our study of symptoms—the relievable side of disease, is private, while our study of anatomy of disease—the side of disease irrelievable by remedies—is public; and while our naming and recognition of diseases which is the means of publicity is founded on anatomy we must continue to be held to the unrelievable aspect of them; and only when our naming and recognition of diseases comes to be founded on symptoms shall we be able to make

publicly sure that private faith in remedies which every one finds in his daily practice to be necessary, and on the whole well founded. A very great boon it would be if the faith in remedies which I believe all experienced men possess in greater or less degree could be tested and confirmed by a comparison of results on the remediable parts of diseases, and could be communicated to their juniors as freely as the hopeless side of disease is communicated. If the anatomy of disease were delegated to its proper position as a distinct science, forming a most important part of the education of the practitioner, but not his chief concern, and if the symptoms were grouped into classes independent of anatomy, I believe that the knowledge of the use of remedies would progress rapidly.

CASES

OF

SUCCESSFUL VERSION AFTER FAILURE OF THE FORCEPS.

BY J. BRAXTON HICKS, M.D., F.R.S.

SINCE the revival by Sir James Simpson of the practice of delivery by turning, in cases where forceps have failed to deliver, most practitioners have, I believe, recognised not only the theoretical grounds on which the principle is based, but also the practical value of the substitution of the one mode for the other.

Many cases have been brought forward to support the practice, some so conclusive that in the very case where the forceps had been employed unsuccessfully delivery of a live child has been accomplished by turning by the feet ; others, by not so crucial a test, have brought forward cases in which there was every reason to believe, guided by the experience of a former labour, that the forceps would not succeed, but where delivery by turning was successful in producing living children. These latter cases, however, do not prove the advantage in so complete a way as the former ; but as a matter of practice they show that in cases of pelvic contraction, where, from actual measurement or from former difficulty, a strong suspicion arises that trouble will again ensue, it is better to turn at once than incur the risk of a double operation, loss of time, and chances of increased irritability of the uterus. The cases here brought forward, which have, with one exception, occurred in the Lying-In Charity of this hospital, are of that kind where the crucial test has been employed. I have not added, with one exception, those (and they are many), in which, with contracted passages, I have employed turning primarily, because these do not, as before said,

bring absolute proof, and, indeed, are rejected altogether by rigid objectors.

The only objections to be made to those cases where the forceps failed are either that a more skilful use of the instrument would have succeeded, or that an instrument with more compressing power than is generally used in England might have so far diminished the foetal cephalic diameters as to have brought the head through.

With regard to the first objection, it would be useless for me to make any reply; but with regard to the latter, an important point is wrapped up in the objection. Doubtless a forceps strong enough in blade, and an operator firm enough in grasp, might succeed in compressing the foetal head as much as traction could do in the podalic presentation by the lateral force against the parts of the brim which oppose the passage of the biparietal diameter, and certainly with less damage to the soft parts of the mother. But then again it is to be rejoined that the forceps so applied may cause greater damage to the integuments of the child than the other mode, and besides, that the pressure not being applied to the part where resistance occurs may even, perhaps, act in such a way as to make the opposition greater.

Certainly, as far as regards the damage to the mother by the traction, no case I have seen has shown that in practice any bad result has followed. To employ version after an exceedingly powerful forceps had failed would, if the head were then forcibly drawn through, be much more likely to produce mischievous results than when less substantial instruments were employed. But a really more important question is, whether by cephalic delivery we should not avoid the risk of injuring the uterus and procuring stillbirth by funic pressure, such as is likely in determined attempts at turning; and this applies to both delivery by a powerful forceps and also by craniotomy. Without doubt this question is difficult to answer. Before chloroform was employed the risk in turning after the protracted action of the uterus, both to that organ and to the foetus, must have caused much hesitation before employing version; but now that relaxation of the uterus is, in the majority of cases, effected by the use of chloroform, the objection to version under the circumstances above mentioned is nearly,

if not entirely, removed. That is to say, that although with chloroform we may still have difficulty, the extreme opposition is almost invariably removed.

In all the cases here presented the use of the forceps was carried as far as I believed safe. Exactly to define the limits to traction is, of course, impossible. In all of the following cases, attended by myself, the results showed that no damage was done to the mother, either by the forceps traction or by traction on the fœtus.

In all but one the opposition produced by the state of the uterus was considerable. So much so in some that it seemed impossible a living child could have been born. This state, as far as regards the child, cannot form an objection against version when craniotomy is the only alternative; but as regards the mother, doubtless, as before mentioned, it will always require very careful consideration how far the chance of saving the foetal life will justify us in risking the bruising and rupture of the uterus. That such accidents may occur is well known, and I subjoin a report of a case to which I was called after the accident had occurred, which shows that anxiety on this score is not unfounded.

The cases here reported show that much difficulty was met with in delivering the head after version, so that I think we may conclude that it was improbable that a delivery could have been accomplished by the forceps. That the choice of the cases for the employment of the two procedures was not groundless, is sustained by the fact that I have had no other cases in which the forceps have been tried and version substituted where it was afterwards necessary to employ perforation. The selection of these cases is a matter of some moment, requiring a careful measurement of the pelvis and an examination of the foetal head with regard to its capability of passing the particular pelvis through which it has to pass.

If there is considerable doubt as to whether forceps will fail, I would always prefer version as the primary operation, provided the state of the uterus were favorable, and that chloroform could be given. But where there is a fair chance of the forceps succeeding, I should always try it first.

The analysis of the cases show four of vertex presentation, where forceps was tried and failed, but by version the

child was delivered. Three of these lived ; in the other, although its heart beat at birth, yet respiration could not be established. In this last and in one of those that recovered inflation of the lungs was employed artificially. In one case the head presented by the face ; vacuities and forceps were unsuccessfully employed, but version succeeded so far as delivery was concerned, but the child was dead. This case is, perhaps, scarcely one of the class to which Sir J. Simpson referred, but the treatment may, I think, be advantageously extended to some face presentations, particularly where the brim is small. In one case version was tried in a succeeding labour as the primary operation with complete success. I have to this added one case in illustration of the employment of version as a primary operation where craniotomy had been employed in a former labour. In this case the child's life was not saved ; still, [it clearly shows how closely these cases may be selected when guided by careful consideration of the history and actual relations of the head to the pelvis as determined by manual examination.

CASE 1.—Failure of forceps ; version ; child's heart beating, but soon ceased.

Mrs. —, Irish, æt. 36, mother of nine children, five delivered by instruments, all of them being stillborn ; two born by natural efforts lived. She had been in very severe labour for twelve hours. I found the head at the brim ; a scalp tumour had formed ; head resting on pubes ; as far as could be ascertained, the antero-posterior diameter of the brim was between three and three and a quarter inches, the right side evidently straighter than the left. The outlet was of natural size. Head was in occipito-posterior position, slightly inclining to forehead presentation.

I applied the long curved forceps, without chloroform, and tried to readapt the head, using traction up to the limits of what I considered safety, but found impassable resistance. Turning was then performed, chloroform having been given, and after some little difficulty the head again was engaged in the brim. By firm traction it slowly passed through, but with considerable resistance, and seven or eight minutes elapsed before the head was born. The funis was pulseless,

but the heart slowly beat. Laryngeal catheterization was employed, and in a short time the beats reached to 120 p. m., but respiration could not be established, and the heart gradually ceased action. The rest was natural. The examination of the child showed nothing but extreme venous congestion of the pia mater, and a large sanguineous scalp tumour.

The patient recovered well.

CASE 2.—Failure of forceps ; version successful ; child living.

Mrs. —, æt. 25, in her third labour. The first labour was moderately long; in the second the arm presented, the child was turned and delivered alive. Labour had been on twenty-four hours when I saw her; the os uteri fully expanded for six hours. The pains had been good, without advance, the head resting on the pubes. I tried to alter its position as much as possible, from the exterior and the interior, without success. Forceps was then applied, and the head was rotated in many directions, while traction was employed as firmly as considered safe, but without any advance. Turning was then employed, and after very firm traction the head passed the brim, and a living child was born, which cried lustily before I left. It was of full size.

The traction employed to bring the head through the brim was as severe as I have ever employed, indeed, more than one would think it possible a child could bear without injury; still, as the child must have died otherwise, I considered it worth the risk.

The mother did well, and was delivered by version next time of a live child after another labour of twenty-four hours without progress.

CASE 3.—Failure of forceps ; version successful ; child living.

Mrs. M—, a stout woman with large abdomen; has had four labours, all the children males, all born by assistance of forceps; two living, two dead.

She had been in labour thirty hours when I saw her. The pains had been strong till lately, with pulse rising; tongue dry; and she was beginning to be exhausted in strength and

spirits. The head had not entered the brim. The transverse diameter of the cavity seemed less than the antero-posterior diameter, which appeared good. Forceps were employed, but they pressed very firmly against the sides of the pelvis. After employing as much traction as I dared I advised version, which was performed by the resident obstetric clerk, Mr. Eager. Much difficulty was experienced in bringing down the foot and raising the head, in consequence of the firm contraction of the uterus. Chloroform was then administered, and the hand passed up again to see the cause, when a kind of hour-glass contraction was found above the head, preventing its rising. I passed slowly my hand by it and retained it *in situ*. Shortly, as I have before found, the spasm relaxed, and then, bringing down my arm, seized the foot in its descent, and brought the breech through. The body very soon was born, but very much difficulty was found to the withdrawal of the head. However, by steady pulling, it passed in from one to two minutes. The child was living, and did well. The mother recovered also well.

CASE 4.—Failure of forceps ; version successful ; child alive.

Mrs. —, æt. 25, primipara. When I saw her she had been in labour twenty-four hours with severe pain, which latterly had become continuous. The foetal head had very slightly entered the brim, but was pressed down firmly on it by the persistent action of the uterus. The pulse was quick ; tongue furred and dry. The antero-posterior diameter was calculated at three and a half inches by digital measurement, and the side loops were imperfect. I scarcely expected forceps to succeed, but they were put on, but no amount of justifiable traction produced any result. She was, therefore, put under chloroform, and the resident obstetric clerk, Mr. Sells, turned. Some difficulty was experienced from the state of the uterus in accomplishing the revolution of the foetus. External pressure, however, lifted up the head to the fundus, upon which the breech descended, and the uterus extruded the body of the child. But the head remained so fixed in the brim that it seemed impossible a live child could be born. However, after a few minutes, the head slowly descended through. There was also much obstacle in the pelvic cavity, but eventually the head was

wholly delivered. The heart was pulsating. By warm bath and laryngeal catheterization I was successful in establishing respiration, and the child lived.

The mother recovered excellently.

CASE 5.—*Face presentation, chin posterior; vectis and forceps tried without success; delivery by version; child dead.*

Mrs. —, Irish, æt. 35, primipara; small woman; pelvis rather below standard; the face had been presenting some hours, but pains moderate. The forehead had been anterior rather to right side, but not fixed, and it seemed easy to move the chin round. The waters had escaped some time, and the uterus grasped the child tightly. The os was fully open.

The vectis and forceps had been tried without results, the latter slipping, and an attempt also had been made to turn, but the uterus prevented it.

When I saw her I attempted reducing the face to a vertex presentation. But although I nearly succeeded, yet ultimately the face presentation remained. I again applied the forceps, but, as they slipped and no movement was obtained, I withdrew them, and, giving chloroform, was able to push the head aside sufficiently to bring down the leg, and in a very few minutes the child was born, but there was no sign of vitality in it. The rest of the case was natural.

CASE 6.—*Failure of forceps; version; rupture of the uterus; head detached; death of mother.*

I did not see this case till the woman was dying. I found the head left in uterus, the uterus ruptured in front through half its length. I endeavoured to deliver the head by the cephalotribe, but the patient died before I could do so.

I found three medical men had been engaged at the case. She was an exceeding fat woman, a multipara, and, as the pains had been ineffectual, the forceps was employed. The uterus was much anteverted, but the brim did not appear contracted. However, as the head did not advance, version

was employed, with great difficulty from the contracted state of the uterus. During version the uterus ruptured. Suddenly she became collapsed and gasping; renewed efforts were then made to deliver, and the body separated from the head. In this state I first saw her; I tried first the crotchet and then cephalotribe, but it was a very hard head, so that its seizure was difficult, and, as she was rapidly sinking, I gave up further attempt as useless.

The obliquity of the uterus and the ossification of the foetal head seemed to produce the difficulty in delivery of the head; and the rigid state of the uterus coupled with, probably, some degeneration of its fibres, rendered turning a fatal procedure.

CASE 7.—Craniotomy in first labour; version in second; child dead.

The patient had been in labour eighteen hours, during which the os uteri had opened slowly, and had been fully dilated about six hours when I saw her. The pains had been all through very forcing and painful. I found the uterus firmly and continuously contracted around the foetus, with slight rhythmical pains. She had a distressed anxious expression. The head was firmly fixed in the antero-posterior diameter, so as to require some little pressure to raise it, when it moved with a jerk. She was anxious to have chloroform, which was given her. I then carefully measured the pelvic diameters, and found the antero-posterior to be about three inches and a half. There was deficiency on the right side of the oblique. Comparing the head with the pelvis, I felt certain it could not pass by forceps, and, as the only other chance of saving its life was by version, the resident obstetric clerk, Mr. Pearse, turned without real difficulty, though slowly, in consequence of the state of the uterus. When the head again touched the brim it remained fixed about four minutes, the face and occiput touching the sides of the cavity firmly; but after fair traction the head was delivered, though too late for life to be saved. Artificial inflation was useless.

The adherent placenta was detached, but she did well.

CLINICAL NOTES.

BY S. O. HABERSHON, M.D.

No I.

PAIN IN THE SIDE.—PLEURISY ON THE DIAPHRAGM.

THERE is a remarkable difference between pleurisy which begins on the ribs and that which commences on the diaphragm. In the one the pain is severe and stabbing in character; in the other it is agonising, and the patient dreads the necessary movement caused by inspiration. The demand of the system for properly arterialised blood is overcome by the painfulness of the process, and the countenance becomes livid and apnoea is threatened because the patient dare not breathe. The expression is one of extreme suffering and of distress. If the disease commence on the right side it is often ascribed to inflammation of the liver, because the physical signs of pleurisy are not present, for as long as the diaphragmatic surface only is affected no friction sound is heard. If the left side be involved then the pain is attributed either to the spleen, the heart, or the stomach. We are led, therefore, to notice some of the peculiarities of pleurisy commencing on the diaphragm; and we remark,

1. The suddenness of the pain and its intensity;
2. The severity of the dyspnoea;
3. The comparative absence of physical signs, as well as of febrile excitement;
4. The presence of pain in the shoulder;
5. Irritability of the stomach, if the left side be involved; and the occurrence of jaundice, if the right side be affected;

6. That the patient is often unable to lie upon the affected side, as in many cases of pleurisy ;

7. The speedy termination in resolution, and more rarely in effusion or consolidation of the lung ;

8. That the disease is often ascribed to the liver.

Care is required in the diagnosis, for the pain may be the neuralgia preceding herpes zoster ; or,

The pain may arise from disease of the spine ;

Local tumour or abscess may be present ; or,

The pain may be caused by direct injury, as a fractured rib ;

Periostitis and perichondritis induce severe local pain ;

Severe neuralgia arises from uterine disturbance.

John L—, æt 32, a man of tolerably temperate habits, had been employed in an emery mill ; and with the exception of a winter-cough for the last five years, he had enjoyed good health. This cough was accompanied by a good deal of expectoration. During the fortnight preceding admission the cough had been more troublesome. On November 26th, whilst at work, he suddenly experienced at each inspiration a cutting pain in the chest below and to the inner side of the left nipple. He had neither rigor, nor headache, nor any febrile symptom, prior to the attack ; but he vomited during the night from the severity of the pain, and he passed the night lying upon his *right* side. He was admitted on the 27th—a spare, ill-nourished man. His countenance was expressive of pain, and occasionally, when taking a deeper inspiration than usual, he caught his breath and uttered a sharp cry, complaining of a cutting pain at the chest. He now lay on his left side, breathing chiefly with the diaphragm, and coughed at intervals, expectorating frothy mucus, with pellets of muco-purulent matter. He had neither headache nor nausea, but complained of thirst ; pulse full, 82 ; respiration 26, temperature 99·7°.

The chest was resonant on percussion except at the left apex posteriorly, where there was marked dulness. The breathing was harsh at both apices. Mucous râles were audible over the chest. A distinct pleuritic rub was heard at the end of the inspiration to the inner side of the left nipple, close to the diaphragm, but there was no dulness on percussion. The sounds of the heart were normal. He was ordered a dose of magnesia

mixture, opium gr. $\frac{1}{4}$, with grey powder gr. ij, every three hours, and a linseed poultice to the side. On the 28th the rub was still audible. 29th, pain was only felt at the end of a deep inspiration, and the cough was less troublesome; pulse 86, respiration 24, temperature 98.6°. 30th, rub still audible. Dover's powder was given at night, and effervescing mixture during the day. On December 1st he was convalescent.

William R—, aged 27, a labourer from Rotherhithe, was admitted December 24th, 1866. He was a man of temperate habits, and his previous health had been good. A year before, when a soldier in India, he had suffered from pain in the back. His present illness came on four days before admission, when he had a severe rigor lasting for an hour and a half, with general pain in the limbs; the pain, however, became especially severe on the right side between the seventh and eighth ribs.

On admission the patient was in great distress from the intensity of the pain, which was located in the right side about the seventh rib, and was greatly increased by the act of respiration. He was lying on his left side, and was unable to lie upon the back; there was slight pain in the joints, the tongue was white and furred, the respiration short and hurried, pulse about 90, skin not hot. The bowels were confined. On examining the chest the right side scarcely moved at all. Slight pleuritic crackling could be heard at the right base at the end of the inspiration, but the right lung was scarcely inflated, and on the left side respiration was very imperfect. The heart was normal. The liver could not be felt. The urine was slightly albuminous, sp. gr. 1010. He was ordered a purgative of colocynth and calomel, and the mixture of acetate of ammonia with solution of morphia and nitric ether, every four hours, and a hot poultice to the side.

The following day the dyspnoea became intense, and he seemed almost in a dying state. Brandy \mathfrak{z} iv was ordered, with senega and ammonia.

December 27th.—The dyspnoea was less, but there was still stabbing pain in the right side. The respiration was puerile on the left side; and at the right base there was dulness, some bronchial breathing, and at the angle of the scapula minute pneu-

monic crepitation; the breathing was less hurried, about 40; pulse 95, compressible; temp. 100°; skin slightly moist. Ordered to continue the brandy, but to return to the first mixture.

29th.—The symptoms were less severe. The respiration was easy; the pulse fuller and more compressible, 95; skin moist, temp. 98°; small crepitation distinct, but less marked and rather larger in character. There had been delirium during the night. The medicine continued. Fish and two eggs allowed.

January 1st.—There was still slight delirium at night, pulse compressible, the skin normal, tongue rather furred. There was dulness at the right base, and the respiration was bronchial, some minute crepitation could also be heard. The apices of the lungs were normal.

3rd.—Convalescent. The respiration free to the base of the right lung, no pain, no cough, the pulse regaining power.

The suddenness of the pain and its intensity are remarkable in this disease; the patient experiences a sudden stab, as it were, in his side, and he is almost asphyxiated from the intensity of the pain, he dare not breathe; this accounts for the severity of the dyspnoea; the affected lung is not inflated, and the patient, by a short, hurried, half inspiration, attempts to supply the deficiency. The comparative absence of physical signs is a very noticeable fact; as long as the diaphragmatic surfaces only are affected, no rub can be heard, and it is only when fibrinous effusion reaches the edge of the lung and creeps, as it were, round the corner, that any friction sound is audible. No one can be blamed for not at once hearing a diaphragmatic pleuritic rub; and, when at first audible, it is only at the end of the inspiration, when the lung is inflated, that the sound is produced. This absence of physical signs has led many of these cases to be ascribed to, or rather called, rheumatism in the side, neuralgia, pleurodynia. The febrile excitement is also in many cases scarcely observable; the temperature is barely, if at all, increased, the pulse is not much excited. If, however, the lung tissue be involved, then the temperature rises in a manifest degree, but in most instances there is a great want of proportion between the rapidity of the respiration and that of the pulse.

The diaphragm receives the phrenic nerve upon its upper

part; the nerve spreads out in a web-like manner on the lower aspect; the phrenic is in close relation in the neck with the nerves which reach the shoulder, and below, it is brought into direct connection with the nervous supply of the liver on the one side, and with the vaso-motor filaments to the stomach on the other.

It is this nervous connection which explains the pain in the shoulder which is a symptom of diaphragmatic pleurisy on the right side, and also the vomiting which takes place when the left side is involved, as in the first case mentioned. This disturbance of abdominal viscera by thoracic disease is shown still more forcibly in some instances by very severe symptoms; jaundice sometimes occurs, and tends to confirm the mistaken view often entertained that there is inflammation of the liver; in truth, the majority of English cases of acute inflammation of the liver are instances of diaphragmatic pleurisy. And if serous effusion takes place, and the liver is pushed down and felt in the right hypochondriac region, the erroneous diagnosis is confirmed; so also on the left side, effusion exerts pressure on the stomach and induces troublesome dyspepsia.

We have known the pain of diaphragmatic pleurisy to be so severe as to be mistaken for gall-stone. The countenance became sallow, but whilst true jaundice was absent pleuritic effusion soon pointed out the nature of the complaint.

In ordinary acute pleurisy the patient reclines towards the affected side, so as to keep the ribs quiet; in diaphragmatic pleurisy, *at first*, the patient may be found lying on the sound side, as if by that means to keep the *whole* of the diaphragm at rest. After a short time, the second or third day, however, the patient remains in a semi-recumbent position, or on the affected side. It is a remarkable fact that some of these cases, which commence with intense pain, quickly subside; and in a few days the patient, if judiciously treated, may be convalescent; if there be serous effusion a longer period is required for its absorption, and if the lung tissue be involved then the symptoms are altogether more severe.

There are several facts connected with pain in the side which have an important connection with the *diagnosis* of diaphragmatic pleurisy. *Herpes zoster*, or shingles, is essentially a disease connected with the nervous supply of the part

affected. It is not only followed by pain, which may continue for several weeks or even months, but before the appearance of any vesicles upon the skin severe pain is experienced in the course of the nerve, and, since the dorsal nerves are frequently affected, it is no uncommon thing for the disease to be mistaken for pleurisy; the sixth and seventh dorsal nerves are, perhaps, more frequently implicated than the others, and from the severity of the suffering and the absence of the physical signs of pleurisy, the malady may at the commencement be mistaken for inflammation upon the diaphragm.

Disease of the spine produces pain in the course of nerves, and although frequently the pain is at the peripheral extremity of the nerve, this is not always the case—it may be quite local. Many years ago a young man was admitted into Guy's, under the care of the late Mr. Aston Key, for bad stricture of the urethra; after a few days severe pain came on in the right side at the lower part of the chest, close to the posterior angle of the ribs; at first it was supposed to be pleurisy near to the diaphragm. Very shortly afterwards paraplegic symptoms supervened, and the patient died; inflammatory softening of the lower part of the spinal cord and disease of the prostatic veins were found. The pain in the side was shown to be of a neuralgic character, and not connected with the pleura at all. There was an absence of the signs of pleurisy, and it could only have been diaphragmatic. These pains in the side, of a spinal origin, are more frequent than is generally supposed, and have been roughly classed together as pleurodynia, rheumatism of the intercostal muscles, &c.

Local tumours are still more deceptive, but in these instances the pain is more *fixed* than in diaphragmatic pleurisy; it may be equally intense, but it is more persistent in the one case than in the other. Several instances of this kind have been brought under my notice. A lady between forty and fifty years of age had fixed pain over the sixth and seventh ribs on the right side; it was increased by respiration; there was no cough, no growth could be felt, but slight pleuritic friction sound was audible; afterwards pain came on in the shoulder. No anodynes were of any service, and after three months of severe

pain she sank. The pain was due to the pressure of a cancerous growth upon the dorsal nerves.

It might seem scarcely necessary to advert to *direct injuries*, as blows or falls, as fallacies in the diagnosis of diaphragmatic pleurisy. And where the rib is really fractured there may be no difficulty, but in slighter injuries the immediate effect of the blow may be almost forgotten when pain supervenes, and it is with difficulty that the injury is connected with the suffering which it has produced. It seems possible that blood may be effused in the course of the nerve, and that fibrinous contraction around the nerve produces the pain. Some years ago a patient was under the care of my late colleague Dr. Hughes, with fixed local pain in the left side, over the lower ribs; no rub could be detected; there was no evidence of disease of the spine, nor of any organic functional disturbance of the heart, lungs, or stomach. The application of a blister relieved the pain, but it returned as the blister healed; the same remedy continued to afford relief, but it was always temporary. Death ensued from another malady, and it was found that the pain in the left side had been caused by a fibrinous effusion about the size of a five-shilling-piece beneath the diaphragm and close to the spleen; this fibrinous effusion had involved the intercostal nerves in their course and was the cause of the repeated attacks of neuralgia. In a lady more than sixty years of age, who consulted me for a similar pain on the right side, over the course of the sixth and seventh ribs, there was some hyperæsthesia of the surface of the skin, but no dulness, no alteration of respiratory sounds, no cough; but at the end of the inspiratory murmur crackling could be heard as from pleuritic adhesion; the pain was constant and severe. After very careful examination it was found that there was some wasting of the intercostal spaces immediately beyond the erector spinæ muscles, and the pain was traced to local injury of spinal nerves from a blow against a chair. The persistency of the pain in these cases is a very distinctive mark of their true character.

The pain in the side produced by *syphilitic periostitis and perichondritis*, although increased by respiration, has superficial tenderness which points out its true character. It will be found also that periosteal disease exists in other parts—on the tibia, on the scalp, on the clavicle, or elsewhere. A lad

admitted a short time ago into Stephen Ward with a periosteal node on the right parietal bone had this form of pain in the side at the lower part; the iodide of potassium which relieved the one was also beneficial to the other.

The neuralgic pain in the side connected with *uterine* disturbance is sometimes of unusual severity; generally it is located beneath the left or right breast, especially the former, and may be so localized as to be covered by a crown-piece. This is the ordinary neuralgic pain of dysmenorrhœa, but I have several times observed it more diffused in character in the lower part of the right or left side, exceedingly severe, increased by respiration, but evidently not inflammatory, and speedily relieved by anodyne remedies, or suddenly ceasing on some powerful emotional excitement or occupation of the mind.

Such are some of the sources of fallacy in the diagnosis of diaphragmatic pleurisy. Sudden pain in the side, with urgent dyspnœa, not produced by any direct injury, and not of a persistent character, is probably due to pleurisy low down in the chest; and if it occur upon the diaphragm the pain is exceedingly severe, whilst for many hours the physical signs of pleurisy may be entirely absent.

The treatment of this disease is often very effective, and it consists in the free use of opium or its alkaloid morphia. If the means be at hand, it may be well to employ the hypodermic injection of morphia in the side, one quarter or one sixth of a grain, or the same dose may be given by the mouth and soon repeated. Opium itself or Dover's powder may be used, but should be given freely and in full doses, so as to relieve the pain and quiet the respiratory act. Warmth should be applied to the side, either in the form of hot linseed poultices, or, what is more effective, the spongio-piline so as to cover the part, having sprinkled upon it \mathfrak{z}_{ss} of belladonna liniment and \mathfrak{z}_{ss} of chloroform liniment. Opium is, however, the remedy for this acute inflammatory disease. Some have used depletion, either in the form of venesection or by applying leeches to the side, but these remedies, although they relieve the pain, are less effectual than opium; the patients are exhausted, and the convalescence is retarded. Again, others are partial to the use of calomel combined with the opium; this combination is, we

believe, unnecessary, and tends to retard recovery. If, however, the bowels be confined, and the viscera engorged, a free calomel purgative or one of blue pill is a valuable aid in relieving systemic oppression and in lessening the severity of the pain.

We have not made any reference to pain which arises from peritoneal inflammation on the surface of the liver, nor to pain in the side produced by flatulent distension of the colon. These are essentially abdominal, and, although they may mislead in the diagnosis of pleurisy, we need not dwell upon their symptoms in a fuller manner.

No. II.

HÆMATEMESIS.

Hæmatemesis ; cirrhosis ; old hydatid in the right lobe of the liver, projecting through the diaphragm ; atrophy of the right lobe of the liver ; second hydatid cyst on the lower part of the liver.

(Reported by Mr. A. W. SMITH.)

James S—, æt. 23, was admitted into clinical ward, under my care, December 7th, 1869. He was a muscular man, but when brought to the hospital was in a state of great prostration from loss of blood. He answered questions curtly and with apparent reluctance. At intervals he had been subject to pain in the abdomen, which he called "spasms." He had been engaged at a fishmonger's and had been in the habit of taking "a little gin" in the morning, but there was no evidence that his habits had been decidedly intemperate. On a previous occasion, which he stated was a long time ago, he vomited a large quantity of blood, dark and clotted in character, but he had not suffered from any pain at the time. On December 7th he felt perfectly well when he got up in the morning ; but soon after breakfast, without any warning or feeling of pain, a sensation of faintness and nausea came on and he vomited a pint and a half of black coagulated blood. He was shortly afterwards admitted into the hospital, and before he reached the ward he again vomited a large quantity of blood, also dark and coagulated.

On admission he was exhausted and restless, but he was not excessively blanched. There was no pain nor tenderness on

pressure at the stomach. The liver could be felt projecting about an inch below the ribs close to the *scrobiculus cordis*, and at the site of the gall-bladder an oval, elastic, circumscribed swelling was felt, which was supposed to be the gall-bladder. The colon appeared to be distended. The swelling, the patient said, "had existed for some time," and occasionally completely subsided and then returned. He had had jaundice once. He was ordered the compound infusion of roses, with sulphate of magnesia, so as to unload the portal system and the intestinal tract. There was no bruit at the heart, but the pulse was 120 and feeble. The patient was allowed cold beef-tea, ice, &c.

8th.—The bowels were acted on three times, the evacuations were black from altered blood, but contained some bilious excreta. The restlessness continued. To take *Olei Terebinthinæ* ℥xxx ex *Misturæ Acaciæ* ℥j every four hours.

9th.—He vomited black clotted blood, with stringy mucus, six times since noon yesterday; about two quarts seem to have been lost in the twenty-four hours, but he has not vomited since he took the turpentine medicine. The restlessness was increased, and he was very much blanched. Nutrient injections were ordered, each to contain an ounce of brandy. He complained of great pain in and over the stomach.

He quietly sank at a quarter past 4 p.m. Inspection was made on the following day. The whole body was blanched. The lungs were collapsed, they were healthy; there were a few old pleuritic adhesions. On the right side, projecting from the centre of the diaphragm, was a swelling, pale in colour and about the size of half a hen's egg. On section it was found to be an old hydatid cyst, filled with thick, semi-gelatinous *débris*, which contained old hydatid membrane and some hooklets. The heart was healthy, so also the large vessels. The veins of the *œsophagus* were, however, unusually distinct. *Abdomen*.—The peritoneum was healthy. The intestines were pale; they were moderately distended, and contained some blood. The liver was peculiar in form; the right lobe was very small, not so large as an ordinary left lobe; it was puckered on the surface, and on its inferior part was contracted (*cirrhus*); the section of this, as also of the left lobe, showed chronic contraction of the glandular texture and

fibrinous effusion. The hydatid cyst mentioned as projecting from the upper surface could be traced through the liver, in the position of the division between the right and left lobes; it had exerted pressure upon the vessels, and had apparently been the principal cause of the atrophy of the right lobe. The gall-bladder was small, it was drawn far inwards towards the right side on the atrophied lobe. The rounded swelling, which was located in the ordinary position of the gall-bladder, was a second old hydatid cyst, about the size of a fully distended gall-bladder. The left lobe of the liver was large, hypertrophied, but cirrhotic. The stomach was pale, except in two patches, one near the pylorus and the other near to the œsophageal opening. The mucous membrane was everywhere entire. The spleen was twice its normal size, and was dense in structure. The kidneys were healthy. The duodenum was also healthy.

The diagnosis that the blood in this instance came from the intensely congested mucous membrane of the stomach was confirmed by the inspection. The diseased liver was the cause of that congestion, and temporary engorgement of the vessels was due to alcoholic drinks. The vessels having become emptied by the hæmorrhage, the site of rupture became undiscernible. It would appear that the hydatid cyst had very little to do with the fatal hæmorrhage. The cyst had, no doubt, interfered with the circulation in the gland, and had caused the atrophy of the right lobe, but the left lobe had supplemented the right by its increased size. It was also doubtful even whether the hydatid cyst had anything to do with the former attack of jaundice.

We were led carefully to investigate other causes of hæmorrhage into the stomach. These causes may be enumerated as follows:

1. Intense congestion of the mucous membrane, connected with distension of the vessels of the vena portæ and engorgement of the liver.
2. Ulceration.
3. Cancerous disease.
4. Purpura.
5. Vicarious menstruation.
6. Aneurism.

7. Venous obstruction, it may be from thrombosis, in states of great exhaustion.

Spurious hæmatemesis is that which follows the passage of blood downwards from the œsophagus, whether effused into that part or from the nose or from the respiratory passages.

The first *form* of hæmatemesis arises from *hepatic congestion*, and is generally connected with the free imbibition of alcohol. These instances are of comparatively frequent occurrence, and they happen with but few premonitory symptoms; the oozing of blood into the stomach produces a sense of weight, faintness, nausea, and then the rejection of the blood in a dark semi-coagulated condition follows. If the habits have been decidedly intemperate we find some indications of hepatic dyspepsia—so called “bilious attacks”—loss of appetite, pain between the shoulders, irregular condition of the bowels, sense of weakness, and mental depression. The quantity of blood ejected is often very large, and although the patient may be completely blanched, the congestion having ceased, the hæmorrhage ceases also, the strength is slowly regained, and recovery takes place. The following are instances of this kind of hæmorrhage.

Benjamin S—, æt. 46, a potman, from Old Kent Road, was admitted December 11th, 1868. He was of intemperate habits; for eleven weeks he vomited everything he ate and drank, and he experienced pain at the stomach an hour after food; three days before admission he had pain in the head and at the stomach, and he vomited three pints of grumous blood. On December 11th he applied at the hospital and was unable to obtain admission; he then went to a public house, and sudden hæmatemesis came on, four to six pints being rejected; faintness supervened, and he was brought in on a stretcher. The countenance was blanched; there was no evidence of disease of the lungs or heart, and no enlargement of the liver; the pulse was very compressible. On the following day he nearly died from syncope. The compound infusion of roses was ordered, and milk and ice allowed to be taken. The next day some brandy was given and then wine, but these were soon omitted and bland nourishment prescribed, with chalybeate medicine. It was found, however,

that the iron produced pain at the stomach, and that also was left off. He slowly gained strength, and on January 4th was able to sit up and take meat diet.

Daniel C—, æt. 50, admitted January 1st, 1868. He had worked on the river-side, and had sometimes taken four quarts of gin during the day; gnawing pain at the stomach was the only complaint. On Sunday, December 29th, he had a "drinking bout;" on Monday he was taken worse, and at seven in the morning began to vomit blood. The hæmorrhage recurred three times on that day and as often on the Tuesday; the day following he was brought to Guy's. He was a large man, pale and blanched; the pulse was 72 per minute, and a soft systolic bruit was heard with the heart; there was no tenderness at the scrobiculus cordis, but a diffused pain in the lumbar, epigastric, and hypochondriac regions. He was ordered the infusion of roses with sulphate of magnesia; on January 4th a dose of castor oil, and bismuth with morphia, were prescribed. The pain soon subsided, he regained strength slowly, and was presented on the 21st January.

The youngest patient in whom I have seen this kind of hæmorrhage was an Irish boy, æt. 13; he had lost his father, and it was probable, that he had drunk intemperately. Four days before admission he had pain in the cardiac region, and two hours previously he experienced sudden faintness and vomited about a pint of blood. The surface was cold, the pulse scarcely perceptible. The chest was normal. There was pain in the head and in the epigastric region, extending to the back, with tenderness on pressure. This young patient soon recovered.

These instances generally do well, but in the one more fully detailed the return of the hæmorrhage led to fatal syncope.

Ulceration, as a cause of hæmorrhage from the stomach, is preceded by more evident signs of indigestion, as pain after food and vomiting, pain between the shoulders and at the scrobiculus cordis; the hæmorrhage is sometimes excessive in quantity, and the first attack may be fatal, but more frequently there is repeated oozing of blood. In some cases the ulcer is of a small superficial kind, and closely resembles the aphthous ulcer of the mouth; or without any thickening of the edges it

may extend into one of the larger vessels of the mucous coat and produce serious hæmorrhage. If a chronic ulcer have formed, repeated hæmorrhage may take place from capillary congestion at its edges or from erosion of those edges by ulceration, or, thirdly, by extension of the ulceration into one of the vessels at the base of the ulcer; and if that vessel be imbedded in fibro-cellular tissue, so as to prevent contraction, the artery does not retract, and the hæmorrhage often proves excessive and of a fatal kind.

The following case was one of great interest; the symptoms were very severe, but were relieved by the persevering use of the blandest forms of nourishment, the avoidance of all stimulants, and gently unloading the colon by the simplest means, as the confection of senna.

Gastric ulcer; hæmatemesis.

George I—, æt. 45, was admitted into Guy's April 20th, 1869. He was by trade a ship-joiner, and enjoyed good health till six years ago, when he contracted a bad cough, which lasted for two years. He had no hæmoptysis; for four years he had had attacks of vomiting, which came on with tolerable regularity about once a fortnight, and lasted eighteen or twenty hours. Two and a half years ago he was admitted into clinical ward under my care with the symptoms of gastric ulcer—pain after food, vomiting, hæmatemesis, &c.—and he left the hospital greatly relieved. From the Christmas to Good Friday of 1869 he had no attack, but between Good Friday, March 26th, and April 20th he had four attacks, of a more severe kind than before. He vomited a small quantity of blood once or twice, and at times brought up thick coffee-ground substance. He had at times passed very black motions; he suffered from pain at the epigastric region, especially after taking liquids; but solid food produced less pain. He had lost flesh considerably. On admission he was thin, and had an aged appearance; the tongue was moist and clean; the abdomen was supple, but there was tenderness at the pyloric region and about the first part of the duodenum. The urine contained an excess of phosphates. Bismuth with soda and morphia were given.

On May 4th he vomited five to six ounces of dark blood. On the 6th he was in severe pain, the face was flushed, the eyes heavy. On the 14th and 26th there was a recurrence of the symptoms. Opium was given, with partial relief. The attacks became more frequent, taking place nearly every third day, and the patient became haggard and prostrate. Morphia and belladonna were tried, the former hypodermically; nitromuriatic acid and oxide of silver were also used. Brandy ʒij was allowed, and afterwards a small quantity of lemon juice to supply the place of vegetables. No medicine appeared to be productive of any permanent benefit, and it was determined to omit all medicine, only using the confection of senna ʒj every night to unload the colon. The brandy also was stopped, and the patient improved steadily. The sickness ceased on September 6th, and there was no return till the time he left the hospital, November 4th. He had then regained flesh, and was able to take meat diet without pain.

Gastric ulcer ; repeated severe hæmorrhage.

William C—, æt. 37, was admitted under my care November 29th, 1867. He was a slate-worker from Rotherhithe, and a man of temperate habits. Two years before admission he vomited a large quantity of dark clotted blood. For two months there had been pain at the region of the stomach, and his food was returned an hour after the meal. For fourteen days the pain became so severe that it prevented him from returning to his work. He made an attempt, however, on the 29th, and suddenly felt nausea and pain in the abdomen as if the bowels would act; he then vomited about three pints of blood, the bowels acting at the same time; for ten minutes he lost his sight (syncope). He was brought to the hospital in an anæmic state; there was pain in the gastric region towards the pylorus, with hardness to the touch. The tongue was furred; the chest was healthy.

Lead and opium were given; there was no return of bleeding, and he left the hospital in a few days.

In this instance it is probable that a chronic ulcer with thickened edges existed at the lesser curvature of the stomach near the pylorus, and that with renewed ulceration the vessels

at the base of the ulcer became perforated and led to the severe hæmorrhage. This kind of ulcer is the one in which a prognosis should be made with caution; as we have said, the bleeding is more likely to be excessive and fatal, or perforation into the peritoneal cavity may ensue.

Cancerous disease.—Hæmorrhage is frequently present as one of the symptoms of cancerous disease of the stomach, but it takes place during the later stages of the disease. Whilst deposit forms in the mucous membrane the surface is entire, at a later period the growth is felt, and the cancerous cachexia is recognised; vomiting may be very severe, but still without hæmorrhage, until ulceration takes place or there is stasis of blood in the vessels. The probability is that, if there have been hæmorrhage at an early stage of gastric disease, the malady is one of ulceration rather than of carcinomatous disease.

Vicarious menstruation.—That there may be a discharge of blood from the mucous membrane of the stomach during a cessation or irregular condition of the menstruation there can be no doubt, but it is not certain whether, in these instances, there is not some superficial erosion of the mucous membrane. There is the closest sympathy between the uterus and the stomach, and the ovaries are associated with the uterus in this sympathetic connection. This is especially shown during climacteric changes and other conditions of excessive functional activity and excitement; it is during these periods that irritability of the stomach and other symptoms of gastric disorder are developed; hence hæmatemesis may occur—

1. During commencing menstruation.
2. During dysmenorrhœa or amenorrhœa.
3. After marriage, when hyperæmia of the ovaries has been induced without conception having taken place.
4. During pregnancy.
5. At the commencement of ovarian disease.

During early life the fear of perforating ulcer of the stomach from gastric disorder is justly felt. Severe hæmorrhage is not observed in this state; sometimes, however, there is oozing, probably from superficial ulceration. The gastric disorder is essentially one of disturbed nervous supply.

To quiet irregular uterine action is the most effectual way

of curing an "hysterical" condition of the stomach, if we may apply such a term to the stomach at all. It is an almost useless task to attempt to allay the irritable action of the stomach itself; food is often instantly rejected, and medicine fares no better. The mucous membrane is healthy, but it is so sensitive to the presence of any extraneous body that violent efforts are induced as soon as any particle of food comes in contact with it. Young women are generally the subjects of this malady, and its onset is preceded by an irregular or painful condition at the menstrual periods. At first the stomach is only irritable at those times, afterwards the irritability persists from one period to the next with scarcely any intermission; the appetite is capricious, and the most indigestible things are taken and retained; at first solid food is rejected, afterwards milk, bread, tea and every fluid substance. The efforts at vomiting induce pain at the chest and stomach, but sometimes there is a good deal of pain at the *scrobiculus cordis*, increased by food, the result of hyperæmia or of superficial ulceration; blood is sometimes present in the ejected fluids; the bowels are generally confined, the countenance is often pale, the pulse irritable; the mind is active, but there is a waywardness and variability which is very characteristic. The emotions are easily swayed from one extreme to another, and the nervous system is very impressible and readily disturbed; but with all this irritability of stomach and constant vomiting the patient does not wear the aspect of any organic disease, and there is an amount of plumpness and a well-nourished condition which is often the surprise of all the friends.

This malady is very distressing from its severity and from its long continuance; months may pass, nay, even years, and the remark is made, "Everything has been tried," and there is no improvement. In many mild cases the removal of all pressure from the stomach and from the anterior surface of the abdomen, with gentle action of the bowels, will afford relief, the diet being carefully regulated; small quantities of the blandest diet, as milk, and soda water, mutton broth, &c., but brandy and soda water are often injurious rather than beneficial, especially if there be any injection about the tongue. Effervescing saline medicines may help; and bismuth, with alkalies and chloric ether, may quiet the irritability of the

nervous system and of the stomach. Small doses of morphia or of opium administered by the mouth, have a like effect, but they sometimes at once produce fresh distress and vomiting from their direct effect on the gastric mucous membrane and on the liver: but where these remedies and others have been tried by the mouth, and the symptoms persist, the medical man is baffled and wearied. In some of these troublesome cases a cure is effected by allowing the stomach to rest completely for a week or ten days, no food whatever being taken by the mouth, but only a teaspoonful or two of water to moisten the throat, nutrient injections being used to supply the need, however imperfect their action may be. Many patients, however, strenuously object to this treatment, and it is often difficult to carry it out, although the partaking of food when instantly rejected can be productive of no benefit.

The irritability of the stomach persists because the cause remains, namely, disturbed uterine function; the mistake is made of treating the stomach instead of the uterus. It is better to quiet the uterus, and leave the stomach alone. In unmarried persons, when menstruation is irregular or painful, it is important to unload the lower bowel by enemata, to maintain quietness in a recumbent position during the menstrual period, to take away any steel busk compressing the anterior surface of the abdomen, and to employ opiate suppositories or injections into the rectum. The uterine nerves are more effectually quieted by local than by general measures. The soap and opium pill is as serviceable a remedy as any that we possess, and more so than belladonna or henbane.

The hypodermic injection of morphia may be most usefully employed, as mentioned by Mr. J. Harrison in the '*British Medical Journal*' of August, 1869.

During pregnancy we find the same sympathetic irritation, sometimes persistent during the whole term of utero-gestation. Medicaments by the mouth are very uncertain, and opium or morphia employed by the rectum is the best remedy, for in the treatment of these forms of disturbance it is as important as in gastric disturbance from renal or from cerebral disease to direct the attention to the origin of the mischief rather than to the reflex expression of it.

There is another state of sympathetic irritability of the

tomach to which we would now advert. In early life, at the commencement of menstruation, and for several years subsequently, the danger is of ulceration of the stomach; but in later life, when menstruation has ceased, an irritable condition of the stomach, which naturally suggests the commencement of organic disease of that viscus, may be produced by disease of the ovaries.

Vomiting every three weeks; slight hæmorrhage; ovarian enlargement.

Louisa F—, æt. 44, was admitted under my care April 27th, 1869. She had had some menorrhagia in February, but not since that time, and for six months she had been out of health. There had been pain after food, the bowels were confined, but the principal symptom was that every three weeks attacks of vomiting came on, with headache; the ejected matters were like coffee-grounds. She was pale and had a distressed appearance; there was no evidence of thoracic disease, and nothing could be felt at the stomach; the bowels were acted upon. Mixture of ammonia and afterwards bismuth were given with partial relief. The periodic return of the coffee-ground vomit led to the suspicion of ovarian irritation, and Dr. Hicks confirmed this opinion by the detection, on vaginal examination, of evident ovarian enlargement.

Hæmorrhage in these cases from the mucous membrane may be purely accidental.

A good sample of such cases is the following, which occurred in a lady whom I had seen in consultation, who had borne several children, and was nearly sixty years of age. She was spare in habit, and for two months had suffered from sickness; there was almost constant pain at the scrobiculus cordis of a burning character; vomiting came on every morning about an hour and a half after breakfast. The pylorus could be felt, the tongue was clean, the pulse compressible and sometimes irregular. The bowels were confined, but easily relieved by aperient medicine. For six months she had been ailing, but except the pyloric hardness the abdomen was supple and resonant. Solids were retained by the stomach better than fluid food. It was believed that the pyloric hardness arose from spasmodic contraction rather than from

cancerous or fibroid degeneration, and the gastric disorder was regarded as functional. The general symptoms did not bear out the idea of organic gastric disease. The irritability of the stomach was relieved by alkalies and by gentle action on the bowels, but still health was not established. Three months later the abdomen enlarged, and it became rounded, dull on percussion, and evidently fluid was present, from the distinct fluctuation. After fully unloading the colon the cystiform character of the effusion was established, and it was found to be contained in a large ovarian cyst. The interesting fact was, the complete subsidence of the gastric symptoms when the ovarian cyst filled, and it was evident that the gastric disturbance had been of a purely functional character. Such cases are far from uncommon, and they often give rise to anxious fears lest cancerous disease be commencing. The same kind of dyspeptic mischief is sometimes observed in men in advancing life with disease of the urinary passages or of the prostate gland.

A patient, lately in the clinical ward at Guy's, presented, in a marked degree, this sympathetic irritability of the stomach. There was hæmatemesis, with pregnancy. The patient was thirty-three years of age. She had had four children; previous to the birth of her second child, nine years before, she had enjoyed good health; but since that time had always been ailing. The catamenia had been absent for nearly three years when she gave birth to her third child. Within the last two years she had had four miscarriages. About a week after the first miscarriage in August, 1867, she was taken ill with scarlet fever, and about a month afterwards vomited "a quart of clotted blood." There was no pain in the region of the stomach at that time. For some years she had suffered from severe frontal headache and occasional vertigo. On admission on November 23rd she stated that she had not menstruated since August 18th, and from the morning sickness, and pain in the breasts, she believed herself to be pregnant; but she had more pain at the stomach than on former occasions, especially after solid food. A week before admission, on rising in the morning, she had felt faint, and vomited about a pint of thick blood. Since that time there had been some blood vomited every day, in less quantity, always preceded by weight

and pain at the stomach; but she did not vomit her food. There was pain between the scapulæ. She was pale, the fingers clubbed; she complained of pain at the scrobiculus cordis, increased by food. The respiratory murmur was normal. A bruit was heard over the lower part of the sternum, apparently exocardial. There was no enlargement of the liver nor of the spleen; urine normal; pulse 104; respiration 24; temperature 100·4°. On November 25th there was hæmoptysis. She coughed up about two ounces of bright frothy blood, and complained of pain across the chest. Lead and opium were prescribed. There was great weakness.

On December 4th the breathing became very hurried, 60 per min.; pulse 120; temperature 100·5°. There was severe pain at the right side, increased by respiration, and a local pleuritic rub was heard below the breast. She complained also of great pain in the right shoulder. There were some enlarged glands in the axilla, but no redness of the skin. On the 6th there was much less pain on the side, she could take a deep inspiration without pain. Respiration 24; temperature 99°; pulse 104. $\mathfrak{m}\mathfrak{x}\mathfrak{v}$ of solution of morphia were ordered every three hours, with julep of acetate of ammonia, and poultices to be continued to the side.

On the 8th she quickened; she was weak and pale, but there was less irritability of the stomach. Temperature 99·4°; pulse 92; respiration 24. The patient seemed relieved, and was ordered 2 gr. of quinine every morning. Two days later two cases of severe erysipelas having been brought into the ward she was recommended to go home.

In this instance exhaustion from childbearing, miscarriage, and scarlet fever, was followed by hæmorrhage from the stomach. It is probable that some ulceration existed. The anæmia consequent on this hæmorrhage was followed by functional cephalalgia, and whilst in this weakened state she again became pregnant. The sympathetic irritation of the stomach led to hyperæmia of the mucous membrane, to abrasion or renewed superficial ulceration, and the bleeding again appeared. It is, however, probable that the condition of the blood itself was favorable to capillary effusion, for we found hæmoptysis took place a few days after admission, then local pleurisy near to the diaphragm on the right side. The disease was one of

irritability with exhaustion, and we believe that opium or morphia were the remedies most likely to be of service, at the same time that the patient was sustained. Lead and opium were given first, and afterwards morphia. After quickening, the stomach was relieved, but there was evidently great sensibility of the mucous membrane. In this case, as in simple hysterical stomach, the attempt should be to quiet the irritable uterus.

I have not attempted in these brief clinical notes to enter into all the points connected with hæmorrhage of the stomach, but rather to dwell upon the facts especially illustrated by those instances which have recently come under my own observation.

No. III.

ON THE INTERNAL USE OF CARBOLIC ACID.

The internal use of carbolic acid has been somewhat overlooked in its more extensive external employment. As creasote, of which it constitutes the most important part, it has been long known as a valuable remedy, and we are indebted to modern chemistry for its separation in a pure form. It is also known by the name of phenic acid and hydrate of phenyl. Miller states, not only that "it is the most abundant acid production of the distillation of pit coal, but that it is produced by the distillation of the salicylates of the alkalies and of the earths." It is likewise found, he says, "amongst the products of the distillation of gum benzoin, and of the resin of the xanthorrhœa hastilis." At ordinary temperature the crystals are solid, but they melt at 95°, and the presence of a small quantity of water renders the crystals liquid, on account of the formation of a hydrate.

The cases in which carbolic acid has been used internally may be divided into two classes. (1) Those in which it can be directly applied; and (2) those in which it acts after absorption into the system.

The first constitutes by far the more important division, for there are conditions of the throat and respiratory mucous membrane, and there are also diseases of the lungs and bronchi,

in which the *inhalation* of carbolic acid is attended with benefit. In some diseased states of the stomach and of the colon also the direct action of carbolic acid may be most beneficial.

The mucous secretion from the bronchi is not always alike susceptible of decomposition. In some conditions of weakness, especially where the bronchial tubes are dilated, and the mucus is retained in the bronchi, putrefactive decomposition ensues, and the breath becomes extremely offensive. Again, in chronic bronchitis the muco-purulent secretion not unfrequently becomes so offensive that the patient is greatly distressed; in these instances carbolic acid may be of great service when employed as an inhalation, for in that way it may more directly reach the decomposing secretions. In these instances the inhalation is of greater value than the internal administration, for in the latter case the remedy is less direct in its application, and is less effectual. In some stages of phthisis the inhalation of carbolic acid also acts as a useful stimulant to the bronchi, and serves to correct putrefactive changes in vomicae, if such already exist. In empyema the remedy may be tried, but in these cases I have been disappointed with carbolic acid, for the inhalation often produces irritation and distress, and the internal employment is unsatisfactory. In diphtheria and disease of the throat it can be still more directly applied. It is, however, in some diseases of the alimentary tract that I have found great benefit from the internal use of carbolic acid. It is an elegant substitute for creasote, and when directly reaching the affected part it will so modify morbid changes that considerable relief is experienced. The acid may be prescribed in a solid form as a pill variously combined, and when the pill is silvered the patient experiences no discomfort from its administration.

In many functional as well as organic diseases of the stomach fermentative action takes place; distension, pain, eructation, and vomiting may be the consequences of this action. In some cases the fermentation is connected with the saccharine elements of food; in others, the aliment is dissolved by the gastric fluids, and being retained in the stomach it undergoes putrefactive decomposition, producing much distress; it is in this latter class of cases that carbolic acid is often of great service. The statement has been made that carbolic acid especially

manifests its action in stopping the development of cryptogamic life, but that it has less influence over fermentation of a purely chemical kind. Experience does not bear out the idea that the whole value of carbolie acid is thus explained ; for in many forms of distension of the stomach and intestines arising from chemical changes, carbolie acid checks the action, relieves the distension, and affords relief to the patient in a fuller manner, we believe, than merely by the destruction of germ ferments. But it is probable that the carbolie acid has, in some instances, a further result ; that it not only lessens the effect of morbid action, namely, the decomposition, but it tends to relieve the cause ; in some it acts as a stimulant to the membrane, the imperfect action of which had caused the malady.

As to the special cases of disease of the *stomach* in which this remedy is of value, we may first advert to those in which its action is detrimental. We have never found that carbolie acid was well borne when there was much irritability of the mucous membrane, nor when there was redness of the tongue ; if, therefore, we have reason to suppose that inflammation of the mucous membrane exists, as shown by excessive vomiting, craving for cold drinks, &c., carbolie acid would increase the distress ; so also if there be simple congestion of the stomach of an active kind the remedy is unsuitable. In these states the muscular coat is easily thrown into action, pain is induced and the patient complains of griping or of spasm. Pain therefore affords an indication that the acid is inapplicable. It is rather in cases of weakness that we find its corrective and stimulant action to be valuable ; the tongue may be partially furred, but it is pale ; the abdomen may be distended and flatulent, but it is free from pain and tenderness ; the appetite may be small and uncertain, but there has not been the excessive use of alcoholic drinks so as to lead to hepatic and portal engorgement ; food is taken, but after a short time decomposition or fermentation ensues, which is followed by painful distension ; if several hours after the meal have elapsed the eructation is more likely to be offensive, and to be due to putrefactive change. It is in these cases of atonic dyspepsia that carbolie acid may be prescribed, and it will be found of greater benefit if taken about half an hour or an hour after the meal. The commencement of fermentative change is

delayed or checked by the acid, and its stimulant action is beneficial.

But the value of carbolic acid in gastric disease is not limited to these forms of functional disorder; in some instances of chronic ulcer of the stomach, if active ulceration has ceased, it may be advantageously employed; in obstruction at the pylorus, whether arising from fibroid or from cancerous disease, it will be found that good result is obtained; but as we have before remarked, irritability of the mucous membrane, redness of the tongue, griping pain and tenderness at the scrobiculus cordis contra-indicate its use.

The mode of administration is a point worthy of some consideration. Carbolic acid if pure and free from water is solid at ordinary temperatures, but it very readily becomes fluid, and it is, therefore, less adapted for employment as a pill. Care, however, and some manipulative skill readily overcome this difficulty; with some of the vegetable extracts it does not easily amalgamate, still with the help of such an agent as a small quantity of gum tragacanth it may be made to combine; in this way it may be given with quinine, with iron, with Barbadoes aloes, &c., as the case may demand; it will, however, unite more easily with the extract of henbane, with compound ipecacuanha powder, &c.

There is an interesting communication in the last number of the 'Medico-Chirurgical Transactions' by Dr. Sansom on some double salts of carbolic acid, the sulpho-carbolates of sodium, potassium, and of other bases; the report is a very favorable one as to their value, and they can be given in much larger doses than the free acid.

The internal use of carbolic acid has in some instances induced glandular irritation; in the case of a young man who was extremely prostrate the carbolic acid was soon followed by salivation; there was profuse flow of saliva, some tenderness of the glands, but no ulceration of the gums.

The case was a very interesting one of anæmia; the patient had become pale, and then had epistaxis which increased the exhaustion; and although the glands at the lower part of the right side of the neck were enlarged, and the spleen could just be felt, it was not believed during life nor shown after death to be one of general disease of the lymphatic system.

Whilst in the hospital he had several slight attacks of epistaxis, and then partial pneumonia, from which he rallied; but ultimately he sank exhausted; there was neither phthisis, nor disease of the supra-renal capsules found after death, no enlargement of mesenteric glands nor ulceration was present; and there was no albumen in the urine. The case appeared to be one of those rare forms of blood change which induce anæmia. We are not prepared to state that the carbolic acid was the cause of the salivation, but record the fact that such a condition followed its employment in this state of anæmia. Irritation of the stomach may also be induced by it.

Flatulent distension is corrected by the sulphites and hydrosulphites, by charcoal, as well as by other remedies; but carbolic acid has advantages over these.

The stomach is, however, not the only portion of the alimentary tract which is liable to distension from gaseous evolution; we find that the small intestine and still more frequently that the colon is subject to flatulent fulness. As in the stomach, this distension may be sometimes traced to fermentation, at other times to mere simple putrefactive change; the fæces are sometimes passed in a state evincing fermentation, having the appearance of yeast; at other times it is the excessive formation of gas that is the prominent symptom. This condition of flatulent colon is sometimes associated with the imperfect excretion of bile, as we find in jaundice from obstruction of the ducts; the natural antiseptic is absent from the intestine, and abnormal fermentation is the result; but in others we know that the mucous secretion from the colon is in an unhealthy state, and thereby favours these changes; we find large quantities of flatus being passed with excessive secretion of mucus; and again a weakened and inactive large bowel is prone to simple distension from gaseous products. This condition of colon is often associated with hypochondriasis; it is present where there is stoutness from insufficient exercise, or from abnormal deposit of fat; it is aggravated by gouty mal-assimilation; it is also increased by the remains of miasmatic poison; and in these states carbolic acid may judiciously be administered. If there be looseness of the bowels accompanying this flatulence, we have found that the carbolic acid may be combined with lime, as we mentioned

in a short notice in the 'Lancet' some time ago, or with astringents as gallic acid. In strumous disease, in the diarrhœa occasionally found at the last stages of diabetes, it may be used. In a patient some months ago under my care with organic disease about the middle of the rectum, no remedy afforded so much relief as gallic acid with carbolic acid ; in this case, however, the remedy was given in a fluid form, as a mixture ; the irritating discharge was lessened by these means more than by the use of the astringents alone. Instead of diarrhœa, we more frequently find the bowel inactive, small scybalous masses are retained in the pouches of the colon, and, although some fæcal matter is discharged, the bowel is not effectually relieved, small scybalæ with fluid fæces pass, but without emptying the intestine ; the transverse colon yields to distension, the stomach is pressed upon, the diaphragm is impeded in its action, the circulation is interfered with, and the patient is greatly distressed. This condition of flatulent colon is not, however, limited to the stout and inactive, we find it in others also. With some a dose of blue pill and a saline purge clears out the bowel, stimulates glandular secretion, and the patient is for a time relieved, but these remedies exhaust and weaken. Again, nitromuriatic acid is often of great service alone, or with taraxacum and vegetable infusions, but these drugs have disadvantages. Carbolic acid is sometimes a valuable substitute, and a good form is to combine it with powdered guaiacum (a grain of each), and two or three grains of dried rhubarb ; this may be made into a pill, and it should be taken once or twice a day soon after meals. The guaiacum resin acts as a stimulant to the mucous membrane of the colon, and no further aperient will, in some cases, be required. Carbolic acid may be employed in the treatment of diabetes as creasote has formerly been prescribed ; and it has acted favorably in mitigating the symptoms when given alone as well as with opium. Its value may be in part due to its direct action upon the elements of food ; but possibly it may be also of service after absorption.

In those cases of disease where benefit was sought for after the absorption of the acid into the blood I can give a less favorable report ; it has been used freely in combination in the form of the sulpho-carbolates in chest disease ; but a more extended trial of these compounds is called for. In none of the

instances in which I have prescribed carbolic acid have I noticed the deep discoloration of the urine occasionally observed after the absorption of creasote, and which has been described by several physicians.

Since the introduction of carbolic acid into medicinal use by M. Lemaire and by Mr. Calvert, and its application by Mr. Lister in numerous instances of surgical practice, its employment has enormously increased; but as its internal use, whether alone, or in chemical combination, or in mere admixture with other substances, is more fully investigated, it will be found that carbolic acid supplies us with a most valuable internal remedy, whereby we may remove the cause of many distressing symptoms of disease.

No. IV.

CASE.—Injury to the head and neck; cephalalgia; convulsive attacks; no loss of consciousness; recovery.

T. N—, æt. 39, was a robust sailor, who had enjoyed good health till his present illness, and was of very temperate habits. He was admitted into Guy's Hospital March 8th, 1869, and gave the following account of his illness. His occupation was in the Lifeboat Service, and whilst employed on December 20th, 1868, in putting out a buoy, a heavy chain swung round and struck him across the left shoulder, neck, and chest, knocking him down. In falling the back of his head came in contact with the skylight on the deck, and the blow stunned him. On coming to himself, he experienced convulsive movements affecting his limbs and trunk, and although conscious he was unable to restrain himself. These attacks lasted for the space of half an hour, and left him in great pain, especially about the head and chest. The pain in the head he described as a "throbbing" sensation, and as "a heaving of the brain." For a week he continued to get worse, but after that time noticed daily improvement, so much so that, after a month's confinement to bed, his medical attendant advised him to get up. During the whole of this time he suffered from pain in the head, and had the con-

vulsive movements, which recurred twice in the day. On attempting to get out of bed, as soon as the feet came in contact with the ground he felt a sensation as though knives were running into the soles, and this feeling extended over the whole body, and was followed by convulsive movements, more severe in character than any he had previously experienced; they recurred, moreover, four or five times during the day, as often as he put his feet to the ground. He took to his bed again for another week, after which time he had so far improved, that he was able to walk from one room to another, but he could only sit up for a short time. As the convulsions and the pain in the head continued, he determined to come to the hospital. During the journey by railway he had several severe attacks, more violent than before, but there was neither vomiting nor loss of consciousness.

The patient was a muscular man, but his countenance was dull and heavy. Whilst being questioned he would hold one or both of his hands to his forehead or temples, press the hands against the head or move them slowly round the part as though in great pain, and sometimes he could not refrain from shedding tears. There was a swelling above the left side of the occipital bone, very slightly raised, bounded above and below by a distinct furrow, and very tender on pressure. There was intolerance of light and sound, and general hyperæsthesia. Mr. Douglas thus describes one of the attacks. He was lying on his left side, and his body became bent in a position of *emprostotonos*, with the chin almost on the chest; the arms were flexed, so also the thighs on the pelvis, and the legs upon the thighs; the convulsive movements of alternate contraction and relaxation affected nearly the whole body, implicating also the muscles of respiration, causing him to utter a short sound upon each contraction. The fit lasted for about forty seconds, and left him with severe pain in the head. He said that he was conscious throughout it, and that his unavailing efforts to stop the convulsions produced pain at the lower part of the chest. The patient affirmed that sometimes he could foretell the advent of a fit by a "peculiar sensation." The pupils were normal, the pulse quiet, the skin cool. He was ordered to be cupped at the back of the neck to 3vj, and

to take gr. xv of bromide of potassium in infusion of orange peel. Fish diet was allowed.

On the 12th the report stated that, although the fits were less in strength, they had not diminished in number, being from six to eight in the twenty-four hours.

On the 16th he had much pain on the left side of the head. The memory was defective; after reading for a short time he could not call to mind what he had read, and a "heaviness" would come over him. A blister was applied to the neck, and iodide of potassium (gr. iij) was added to each dose of the bromide.

24th.—The pain in the head was much relieved, and the intolerance of light had lessened; the fits had greatly diminished, one last night and one in the morning. Temperature 98.4°; pulse 70, full and regular.

On April 5th he tried to sit up, but was compelled to return to bed on account of giddiness. The attacks had lessened, but still there was much pain in the head.

On the 12th the exertion of speaking to his friends brought on an attack, and he suffered afterwards from the noise caused by a delirious patient in the ward.

On the 17th he was able to sit up without giddiness, but he complained of great pain in the back whenever he attempted to bend in any way. The pain extended from between the shoulders to the lumbar region. Any noise in the ward increased his distress, and the emotions were very easily excited. For a few moments he sat with the sun shining on his head, and great faintness was produced. The ammoniated tincture of valerian was given, and afterwards the assafoetida pill with sulphate of zinc. The pills were apparently beneficial, but were left off, because he complained of the difficulty of swallowing them; the mixture was continued, but afterwards changed for the valerianate of zinc. He slowly improved, was able to sit up for a longer period; the attacks entirely ceased, and the emotions were less easily disturbed. During June he was able to go about the hospital grounds, and in July he left the hospital convalescent. A few weeks later he wrote to me, saying that he was quite well.

This case was one of great interest, and peculiar in its character. The patient was in sound health, till he received a

severe blow upon the shoulder and neck; he was knocked down, and in falling struck his head, so that concussion of the head was added to that of the spine. The severe shake was followed by disturbance of the whole cerebro-spinal system; the spinal and sensory centres were especially affected. There was general hyperæsthesia, and the senses of sight and hearing were distressingly acute. Any emotional excitement, and almost any mental effort, brought on convulsive movements, or tremors, sometimes more severe in character, but there was no loss of consciousness. The condition closely resembled hysterical epilepsy, but with less cerebral disturbance; and it is probable that the state was closely allied to hysteria. In the latter the functional activity of the spine is perverted by peripheral disease, namely, in the uterus; here the effect of a direct blow was to alter the nutritive energy. There was no febrile disturbance, the temperature was not raised, nor the pulse quickened, and we regard the malady as more functional than organic in character. No permanent injury was left, but for a long time the nervous system would be unduly susceptible. How far the vaso-motor nerve was concerned we cannot say, but nutrition of the body generally was normal, and the ordinary functions were duly performed. It would seem that the first effect of the injury was to disturb the capillary circulation, and as a consequence of the checked, and afterwards excited action, the nutrition of the nerve structures underwent change, and with that change the functional integrity was lost for a time. The equilibrium was gradually restored, and health regained. In all cases of this kind *time* is an important element in successful treatment. There is some danger of too active measures being employed; a cupping-glass was applied to the nape of the neck, but it did not afford so much relief as a blister subsequently used. Under the use of the bromide of potassium, to which the iodide was added, he slowly but steadily improved. When the convulsive movements had subsided, and a condition of weakness and of emotional disturbance only remained, the valerianate of ammonia, and afterwards zinc, were given. He left the hospital convalescent.

In the next case the result was less favorable; a considerable period elapsed between the injury to the head and the fatal illness. More than two years passed before any pain came on,

but we believe that the disease was traceable to the injury, and that the long respite he enjoyed was another proof added to many that great care is required in estimating the ultimate result of accidental blows. Hypertrophy of the bone was produced, and severe pain; this pain was believed to be the result of meningeal mischief, but the post-mortem examination showed that the dura mater was free. As disease advanced an epileptic convulsion came on, and the urine was highly albuminous; the latter condition was first believed to be the cause, but was soon found to be rather the effect of the epileptic convulsion; it passed off, and the urine remained healthy. No disease of the kidney could be detected on inspection. The subsequent symptoms were clearly traced to disease on the right side of the brain, and arose from inflammatory softening which reached the surface at the fissure of Sylvius, and extended backwards to the right side of the pons. The immediate cause of death was the implication of the respiratory nerves. The disease could not be traced to syphilis, nor to intemperance, and the changes in the bones and afterwards in the cerebral substance were due, we believe, to the direct injury from the blow of the hammer four years before death. The prognosis requires extreme care in these instances, for concussion of the brain and of the spine may lead to severe symptoms years after the injury. In the first case, if it had been a railway accident, and the patient had appeared in court during the first three months, the evidence would have shown that the cerebro-spinal system had been seriously injured and the damages would have been awarded accordingly, but with rest and quiet all the symptoms subsided, and the patient wrote after leaving the hospital to say that he felt well. He *may* have no return of the symptoms. But in the second case the man was soon at work; two years later he assisted in laying down the Atlantic cable; he then became an engine driver, and it was whilst so employed that the pain in the parietal bone came on. No fresh injury had been received. This interval of unobserved symptoms of disease is more frequent after spinal than after cerebral concussion; long intervals elapse and then the altered nutrition of the spinal cord manifests itself in disturbed condition of motor and sensory nerves. And whilst there is danger of too active treatment and impatient meddling soon

after the injury has occurred, there is also fear lest the first symptoms of permanent mischief be overlooked on account of the long immunity from suffering of any kind.

CASE.—Blow on the head ; epilepsy ; local softening ; hemiplegia four years afterwards.

J. B—, æt. 37, was admitted into Guy's Hospital under my care, December 7th, 1868. For several years he had been a mechanic, and four years before his present illness a hammer fell directly upon the right parietal bone, he was rendered insensible, but recovered so as to be able to return to his work on the following day, and no untoward symptom followed at once. Two years later he assisted in the submersion of the Atlantic cable, and on returning home he suffered from severe pain in the lumbar region, but without loss of motion or of sensation in the legs. He then became an engine driver, but at this time severe pain in the head came on ; the pain was intense, and was local over the frontal and occipital region, but especially over the right parietal bone. There was no loss of speech nor of power—no history of syphilis, nor of intemperance, nor of rheumatism. During the last few weeks the pain had become so intense that he sought for relief. Four days before admission he fell down in an apparently insensible condition, with convulsive rolling of the left eye and slight foaming at the mouth, but there was no convulsive movement of the extremities. He remained in a drowsy state, with partial anæsthesia and loss of power of the left side, and in this condition he was admitted. He could protrude the tongue with difficulty, but it was not turned to either side ; it was covered with a thick brown fur. The pupils were equal and normal in size ; there was perfect command over the muscles of the eyeballs and over the muscles of mastication. The power of movement and sensation were somewhat impaired on the left side, and the arm was more affected than the leg. There were muscular twitchings of the right arm and leg ; there was involuntary discharge of both urine and fæces ; the pulse was 80, more feeble on the right than on the left side ; respiration 16 ; chest healthy. The hepatic dulness was normal, the urine

was dark and turbid, its sp. gr. was 1025, and it contained decided quantity of albumen. The house physician ordered calomel gr. vj, followed by a dose of castor oil. On the following day, the 9th, the involuntary emission of urine and fæces had ceased, but the patient was still drowsy and the urine albuminous. On the 10th he could answer questions rationally, and the albumen had disappeared from the urine. He was ordered the iodide of potassium gr. v, in mint julep, and a blister to be applied to the neck. On the following day, the 11th, the urine became phosphatic. On the 15th he complained of pain on the right side of the head; he was even more apathetic; the power of the left side was a little improved, but micturition and defæcation were again involuntary. On account of the fixed pain on the right parietal bone the ferrum candens was applied, and the mixture of the perchloride of mercury given. On the 21st he was more drowsy, respiration slightly stertorous, he appeared rational, but speech was almost absent. The mobility of the chest on the right side was greatly lessened; there was some dulness at the base of the right lung, but on both sides were loud mucous râles over the lower lobes. The heart sounds normal. The face was congested, as if from pulmonary congestion; he did not refuse to take food, but was unable to swallow. He had no sickness, nor had he suffered from vomiting. On the 20th there was return of the convulsive movements of the eyeballs, the right eye being strongly drawn inwards, but there was no twitching of the extremities; there was general insensibility, with paralysis of the left side; both pupils inactive, the right pupil rather larger than the left; pulse 94, respiration 27, laborious; no unnatural heat of surface, motions involuntary; breathing stertorous. He was unable to swallow, and there was great obstruction of the respiratory apparatus, the bronchi appeared to be plugged with mucus, no mobility of the right side of the chest; abdomen flat, tongue very foul; breath offensive; there was occasional twitching of the right extremities. On the 22nd no improvement in the symptoms. A cupping-glass was applied to the back, pulse 120, temperature 100°, respiration 38. Nutrient injections were ordered. On the 23rd, pulse 120, temperature 98°, respiration 52 per minute. The obstru-

tion in the lungs increased and appeared to be the immediate cause of death.

Inspection twenty hours after death.

The cranial bones were generally thickened; the dura mater was easily detached; the membranes were natural, except at the upper edge of the right Sylvian fissure, where was a small spot of pus, like lymph, as large as a threepenny piece. The grey matter of the right half of the brain was wasted, the remaining portions were highly granular. The right half of the pons was softened and easily washed away. The anterior half of the right corpus striatum was soft and broken down. There was lobular pneumonia of the lower lobe of the right lung.

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Since the above notes were written, another instance has passed through the clinical ward of functional disturbance of the nervous system following a fall upon the head, and a fourth has been admitted. We mention this circumstance to indicate the frequent occurrence of these maladies in the wards of a large hospital. After many months of apparent health the symptoms of disturbed function or of organic change present themselves, when the injury previously sustained has been almost forgotten. Mr. Savory, in an interesting paper on the effects of injuries to the spinal cord, published in the last number of the 'St. Bartholomew's Hospital Reports,' justly dwells on their *remote* effects. There may be no paraplegia, and no local tenderness of the spine; but a condition may be produced which quite unfits a person for the duties or pleasures of life. It matters little whether the symptoms be called "hysteria," "hypochondriasis," or "nervousness;" but they are due to disturbance in the functional integrity of the spinal cord, and may be traced to previous concussion of the cord, and perverted nutrition consequent on that injury.

A DESCRIPTION
OF THE APPEARANCES OF THE
HUMAN EYE IN HEALTH AND DISEASE
AS SEEN BY THE OPHTHALMOSCOPE.

FOURTH SERIES.—GLAUCOMA.

By C. BADER.

IN every eye suffering from glaucoma we observe abnormal changes in the optic disc, in its blood-vessels and in those of the retina, and in the tunics immediately adjoining the disc.

The optic disc.

1. *Changes of surface.*—The surface of the optic disc in advanced glaucoma, instead of being slightly above the level of the retina, is depressed, “cupped,” through destruction of the optic nerve-fibres, of the transparent connective tissue, &c. A cup-shaped surface, “a cup,” occupies the place of the optic disc (see Plate I, Fig. 1).

We distinguish the margin, the sides and the bottom of the cup. The margin of the cup in advanced glaucoma is prominent, sharp, and formed by a few blood-vessels, and by the sclerotic (*i. e.* by the inner edge of the sclerotic aperture, which projects into the area of the cup); in addition we find in cases where sight is not quite lost, a more or less thin layer of optic nerve-fibres, and of transparent connective tissue. An experienced ophthalmoscopist may sometimes be able to see what proportion of optic nerve fibres has escaped destruction, by observing the line of demarcation between these

res and the vitreous substance at the margin of the cup. The margin of the cup, if it project considerably, gives rise to well-marked bluish grey crescentic shadow, when light is thrown into the cup. This shadow shifts, according to the direction from which the light comes.

A white ring (the inner surface of the sclerotic) round the optic disc, or a white crescentic figure (the inner surface of the sclerotic overlying the outer margin of the disc), is in many cases observed even in the early stage of glaucoma, as seen in Plate II, fig. 3; in all cases of chronic and simple glaucoma, as in Plate I, fig. 1, and Plate II, figs. 4, 6. After iridectomy this white figure becomes irregularly shaped and larger, as shown in Plate I, fig. 2, and Plate II, fig. 5. This figure resembles that, in myopic eyes, is termed the crescent. It is seen combined with the crescent in the glaucomatous optic disc of a myopic eye represented in Plate I, fig. 3.

The sides and the bottom of the cup are formed by the sclerotic, by a varying quantity of transparent and of white connective tissue and of optic nerve fibres, and by the trunks of the blood-vessels. The cup is filled with fluid and with vitreous substance, sometimes mixed with blood (see Plate II, fig. 4). The cup at first is shallow, and confined to part of the optic disc; it appears to commence in the portion of the disc next the yellow spot. It becomes deeper and steeper gradually, and may extend beyond the outer sclerotic aperture. The cupped optic disc is met with in the later stages of all forms of glaucoma; it varies in degree in the two eyes of the same person. In the early stage of glaucoma we often do not find the optic disc conspicuously cupped; it generally appears pinkish red (see Plate II, fig. 3), with the retinal vessels well marked on the retina, less so in the optic disc. We may always suspect glaucoma, if we find this kind of hyperæmia of the retina and optic disc. The cup increases in depth most rapidly if acute inflammation attacks eyes affected with "chronic glaucoma."

(2) Changes of colour. The cupped optic disc, especially in advanced glaucoma (see Plate I, fig. 1), appears anæmic—of grey or waxy-white colour—and more so at the deepest part of the cup. Effusion of blood into the cup occurs sometimes, and causes the cupped optic disc to appear red; it may then be mistaken for a healthy optic disc, unless attention be paid

to the course, calibre, &c., of the retinal veins. These, on reaching the red cupped optic disc, disappear abruptly at its margin.

In many cases great hyperæmia (redness) precedes the anæmia (whiteness) of the glaucomatous optic disc; in others (such as in some cases of simple glaucoma) the optic disc is anæmic from the commencement. An optic disc which appears white on the side next the yellow spot should always carefully be examined as regards the pulsation of the arteries and the course, calibre, &c., of the retinal veins.

The blood-vessels in the optic disc and retina. Changes are seen in the colour, calibre, course, and pulsation of the blood-vessels in the area of the optic disc, as compared with those in the retina. The larger vessels in the glaucomatous retina are veins; the arteries are much less conspicuous and barely visible in advanced glaucoma. Pressure (abnormally increased tension of the eyeball) upon the area of the optic disc prevents the free passage of blood. The veins in the retina appear wider and often slightly tortuous. At the margin of the cupped optic disc the same veins at once become narrow, and in the optic disc itself they appear pale red and thin (see Plate I, fig. 1); they may disappear altogether behind the margin of the cup (see Plate I, fig. 3).

The course of the blood-vessels is altered; those on their way to and from the retina have to pass through the optic disc. The following alterations in their course are characteristic of the cupped condition of the optic disc, and to the less experienced ophthalmoscopist are the only reliable signs of the existence of a cupped optic disc. The greater number of vessels appears displaced towards the side of the cup, which lies nearest the yellow spot (see Plate I, fig. 1, and Plate II, figs. 4, 5, 6). The veins of the retina have to pass round the margin of the cup to reach their point of exit from the disc. If, as in advanced glaucoma (see Plate I, fig. 1, and Plate II, fig. 4), the margin of the cup is very prominent, a portion of the veins is hidden from view by that margin. The veins in the cup appear displaced compared with their corresponding portions in the retina; they do not seem to be the prolongations of the latter (see Plate I, figs. 1, 3, and Plate II, figs. 4, 6). This deceptive appearance is increased by the veins in

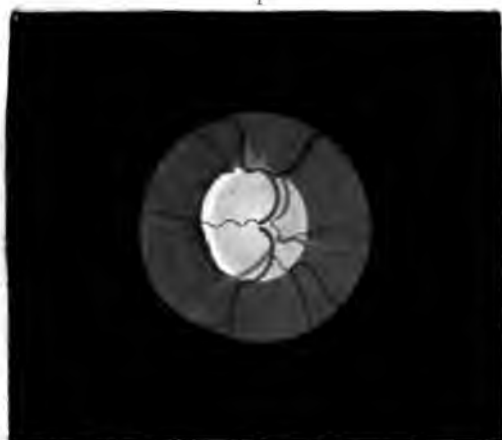
the cup appearing much smaller than those in the retina ; some can barely be traced in the optic disc, others are lost sight of altogether. Even in the early stage of glaucoma we may see the trunks of the retinal vessels in the middle of the optic disc, instead of advancing straight forwards, to be bent towards the side of the disc nearest the yellow spot.

Glaucomatous eyes are remarkable for the facility with which pulsation of the arteries is produced in the optic disc by the slightest pressure upon the eyeball—*e. g.* during ophthalmoscopic examination. The pulsation is nearly synchronous with that of the radial artery ; it consists in a brisk emptying and filling of the arteries in the area of the optic disc ; this visible pulsation extends from the point where the arteries appear in the optic disc to where they reach its margin.

Pulsation produced by *very* slight pressure upon the eyeball is met with in the early stage as well as in the later periods of all cases of glaucoma ; it is found to exist spontaneously, particularly in glaucoma with slight attacks of inflammation.

For details of the morbid changes observed by the ophthalmoscope in other parts of the glaucomatous eye, see pages 390 to 406 of my book on the Natural and Morbid Changes of the Human Eye.

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2



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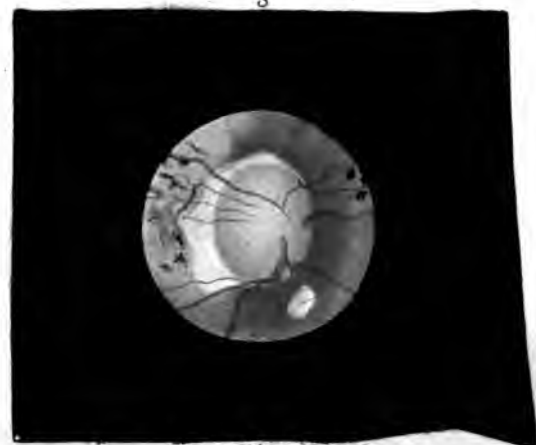




PLATE II.

FIG. 1.—The optic disc (right eye), with a narrow red strip of the tissue adjoining it, as it appeared twenty-four hours after an attack of “glaucomatous” inflammation. The shape of the disc is normal; its colour is much altered, owing to disturbances in the circulation of the blood-vessels, where they pass through the optic disc and over the rim which surrounds it. This disturbance of circulation, &c., is the result of suddenly and greatly increased tension of the eyeball (prior to the disc). The optic disc is anæmic (pinkish white) in the centre, and has a bluish-white colour. The red rim next the whitish one, which surrounds the disc, represents a portion of vascular choroid, upon which we observe the retina gorged with blood. Over the white rim and in the optic disc the retinal vessels are more or less empty and scarcely visible.

Note.—The white rim round the optic disc ought to have a more normal colour.

FIG. 2.—The optic disc (represented in fig. 1), as it appeared three days after iridectomy. The disc has a pinkish grey colour. A striking change is seen in the blood-vessels which pass through the disc, compared with those in fig. 1. The numerous full veins of the retina are well seen in the optic disc; the arteries appear nearly as thin as they did before the iridectomy.

Note.—This figure is represented upside down; the white rim round the disc ought to be of a more dirty grey colour.

FIG. 3.—The optic disc (left eye), with a narrow strip of the tunics adjoining the fellow eye of the same patient, affected with “acute glaucoma” (See Plate I, fig. 1). The shape of the optic disc is normal; it appears red (hyperæmic). The smaller vessels (veins) appear thinner over the white rim and over the margin of the retina.

Note.—The colour of the optic disc ought to be the same as that of the fellow eye.

FIG. 4.—The optic disc and a small portion of the adjoining tissues. The disc is surrounded by red (the vascular choroid), has an oval shape and a bluish white colour; a few thin blood-vessels with a small red spot are visible in the retina. The vessels (veins) in the retina are well marked, they wind round the margin of the disc above and below, and disappear suddenly; the disc appears to be deeply cupped.

The sketch is taken from the left eye of a person aged 42; the eye blind for five years. At the time of the ophthalmoscopic examination T + 2 with large ciliary staphylomata.

FIG. 5.—The optic disc and a small portion of the adjoining tunics. A narrow strip of vascular (red) choroid surrounds the optic disc. The disc has an oval shape and a bluish white colour. The white irregular margin intervenes between the (red) choroid and the margin of the optic disc on the inner surface of the sclerotic. The vessels (veins) of the retina are seen in the optic disc as in the retina. In the disc they appear displaced to the margin to the left, they are still seen to wind round the margin of the disc.

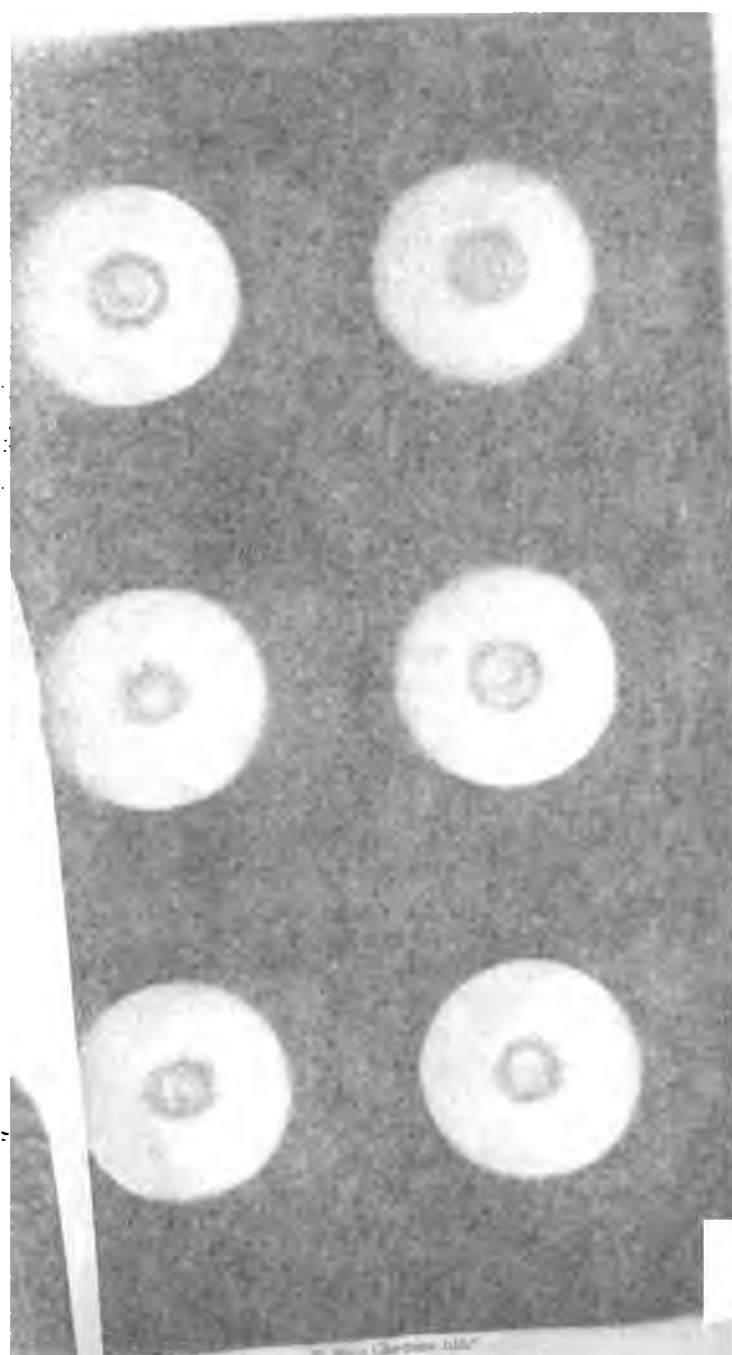
The sketch is taken from a person aged 65. The eye (right) blind for two years, and never painful nor inflamed. Three months before making the sketch the operation of iridectomy had been performed.

Note.—The optic disc along the margin to the right ought to have a bluish colour.

FIG. 6.—The same optic disc, &c., as represented in Plate I, fig. 1. The size, colour, &c., is represented exactly as it appeared to the eye when examining with an ordinary ophthalmoscope and a convex lens of a half inch focus. The same as regards size applies to figs. 1 to 5 of Plate I, while figs. 1 to 3 of Plate I represent the optic disc, &c., more enlarged.

Note.—The white crescentic figure, skirting the margin of the optic disc below, is carried too far to the right; the vessels should be represented round the bluish margin of the optic disc.

The original drawings, of which these chromo-lithographs are copies, were made by Mr. R. Schweizer. In addition to the points of difference alluded to, all the figures are coarser than the originals.



DESCRIPTION OF THE PLATES.

PLATE I.

Fig. 1.—The optic disc (left eye) with the tunics immediately adjoining it, of a person (æt. 38) suffering from simple glaucoma. The bluish white circular figure in the middle of the drawing represents the cupped optic disc; the dull red part, together with the brownish pigment spots (groups of stellate pigment cells) the choroid. The white crescentic figure, skirting the margin of the optic disc to the left, is a portion of the inner surface of the sclerotic.

The enlargement and dark colour of the veins in the retina, their winding, especially above and below, round the margin of the cupped optic disc, and their sudden disappearance there, are well seen.

The retinal arteries and veins in the cupped optic disc appear pale, red, and displaced towards the right (in reality left) side of the disc.

Note.—The central portion of the optic disc, immediately adjoining the blood-vessels, ought to be white.

The retinal veins, which approach the optic disc from below, ought to be thicker.

Fig. 2.—The optic disc (right eye) with the tunics immediately adjoining it, of a person (æt. 70) suffering from chronic glaucoma. The first attacks of "glaucomatous" inflammation appeared six months ago. The sketch was taken sixteen days after the operation of iridectomy.

The optic disc (the disc-shaped figure in the centre of the drawing) presents the normal pinkish white colour of that of a healthy eye. The margin to the left is skirted by a black pigment; the margin to the right of the disc by a white figure (the inner surface of the sclerotic); this figure, where it joins the red colour of the choroid, has an irregular outline; nearly along its entire length a brownish red line of pigment intervenes between the white figure and the red choroid. The vessels of the retina, in the optic disc, are slightly displaced towards the left side of the disc. The only abnormal feature is a bend in their course in the optic disc close to its margin.

Note.—The bend in the vessels, represented on the white figure adjoining the optic disc, should be in the disc itself, as indicating the cupped condition of the disc.

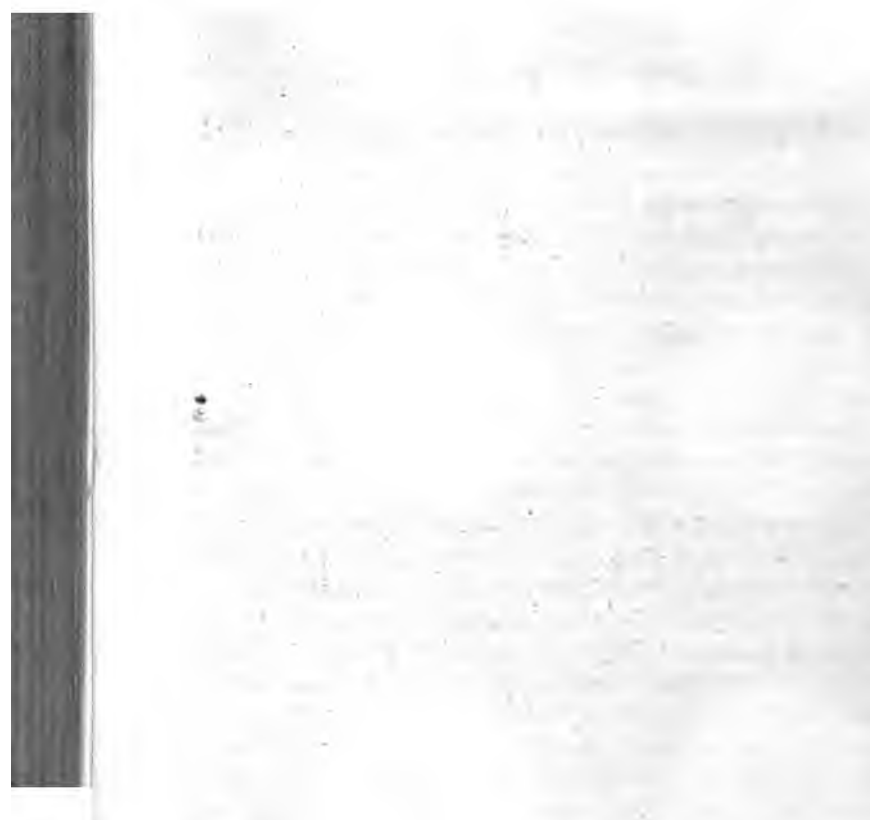
Fig. 3.—The optic disc (left eye) and the tunics immediately adjoining it of a person æt. 18, suffering from chronic glaucoma with a very high degree of myopia, —requiring a concave lens of two inches (negative) focal distance.

The optic disc, of oval shape and nearly uniform pink colour, occupies the middle of the drawing. Adjoining its margin to the left and near its margin below, we observe a white figure (the inner surface of the sclerotic). To the right of the optic disc we see the deep red colour of the choroid which further on assumes a lighter red tint. Adjoining the white figure the choroid has a pale yellowish-pink colour, and presents blood-vessels and pigment spots. An explanation of these changes in the colour of the choroid will be given in future series of drawings, illustrating myopia. Here we will only insist upon the changes which depend more especially upon glaucoma. These are the cupped condition of the optic disc. Even an experienced observer might fail to recognise this condition, judging from the colour of the optic disc alone, if it were not for the characteristic course of the blood vessels (veins) of the retina, at the margin of the optic disc. These wind round that margin and disappear suddenly behind it; in the disc they are but faintly visible; we infer from this that, especially near the margin to the right, the disc is deeply cupped (its sclerotic margin undermined). The pink colour of the disc is probably due to a mixture of blood with the contents of the cupped disc.

Note.—The vessels over the white figure, adjoining the optic disc, ought to be thinner, and the larger ones ought to bend abruptly round the margin of the disc. A narrow line of brownish-black pigment, along the margin of the white figure to the left, is omitted. A fine grey line, indicating the margin of the optic disc to the right of the disc, and round which the retinal vessels wind, is omitted.



W. West Chromo lith.



ON
SOME AFFECTIONS OF THE NAILS.

By C. HILTON FAGGE, M.D.

AMONG writers on diseases of the tegumentary organs very few have paid much attention to affections of the nails. Some indeed—among whom may be mentioned G. Simon and Erasmus Wilson—have devoted to this subject chapters in their systematic works. But even here the changes in the nails will be found dealt with independently and without reference to the general cutaneous diseases of which they form a part.

Other authors, again, in treating of one and another disease of the skin, have mentioned that the nails are liable to be affected by it; but I have not found it easy from their descriptions to tell whether the changes in the nails in these diseases are identical or different. Among the general cutaneous affections which are liable to attack the nails the principal are, I believe, syphilis, psoriasis, eczema, favus, ichthyosis,¹ and rhinoderma² (pityriasis pilaris).

Mr. Hutchinson has published, in the 'Transactions of the Pathological Society,'³ and in the atlas of plates of the 'New Sydenham Society,'⁴ some most interesting illustrations of various affections of the nails.

In the present communication I can only attempt to give reports of some cases of such affections which have come under my own observation.

Parasitic disease of the nails. (Onychomycosis.)—The growth of a vegetable parasite in the substance of the nail appears to occur under two distinct conditions, which have, however, been confounded together by some writers, including Neumann.⁵

¹ See p. 320 of the present volume of these Reports.

² See p. 341 of ditto.

³ Vol. xii, p. 260.

⁴ Plate xvii.

⁵ 'Lehrbuch der Hautkrankheiten,' 1869, p. 346.

1. The first of these conditions occurs in patients suffering from some parasitic disease of the scalp or body generally, in whom one or more of the nails becomes secondarily affected. This is most frequently observed in cases of favus, as has been described by Bazin, Anderson, and others. In the 'Transactions of the Clinical Society'¹ I have given accounts of three such cases. One of these occurred in a girl affected with favus, whose case is recorded in another part of this volume; the two other patients were sisters affected, the one with tinea tonsurans, the other apparently with t. decalvans.²

The most important point which I endeavoured to establish in the paper above referred to is that in favus of the nail the growth of the fungus takes place in a manner different from that described by Bazin, who has generally been followed in this matter by subsequent writers. According to Bazin the favus fungus is developed on the under surface of the nail, and may at first be seen through its transparent substance. Gradually the nail becomes thinned by it, and is subsequently perforated, when the parasitic mass assumes more or less the character of an ordinary favus cup. In my case, on the other hand, the fungus lay within the nail substance, and was distinctly interstitial, from an early period. It gave a uniform yellow colour to the part of the nail affected by it, and this gradually became more extensive, encroaching on the nail more and more towards its root.

Models of these cases was made by Mr. Towne, and have been placed in our museum.

2. The second condition under which the nails become affected with a vegetable parasite was first described by Meissner,³ and

¹ Vol. i, p. 77.

² Since the present paper was written, a family suffering from tinea tonsurans have come to me as out-patients, in two of whom (the mother and the eldest girl) the nails are diseased. Each patient has one nail affected, that of one little finger. The change in the nails is not very striking, but their surface is roughened and striated longitudinally. The fold of skin over the root of the nail is thickened and slightly reddened. The fungus is present in the nail-substance in considerable quantity, in the form of long beaded and branching tubes. Rows of spores are also seen, which are remarkably large, very much larger than the spores ordinarily seen in tinea tonsurans of the scalp. In these respects the appearances are precisely the same as those observed in the cases of the two sisters above referred to. I am not aware that any writer on this subject mentions an affection of the nails as occurring in association with tinea tonsurans.

³ 'Vierordt's Archiv,' xii, 1853, p. 193.

subsequently by Virchow.¹ Meissner's case was that of a man over eighty years old, in whom all the nails (except that of one fore-finger) were broad, thick, strongly convex, resembling claws, and striped of a yellowish-white or brown colour. They were movable on their beds and could be split like wood. The affection was only noticed post-mortem.

In Virchow's three cases, again, the disease was observed only in the dead body; the nails affected were all toe-nails.

The following case was one of a similar kind :—

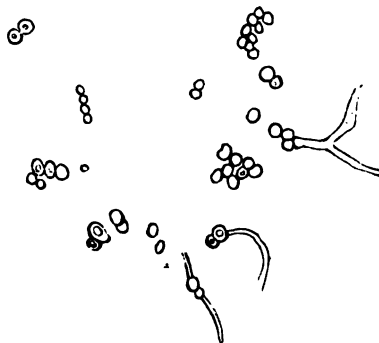
(The description of the early part of this case is from Notes by Mr. ABBOTT.)

CASE.—J. P., æt. 55, came to me December 8th, 1868, on account of an affection of the nails, "which were thick and yellow at the edges, and more easily cut than natural. The change is only partial, occurring generally in one extremity of the side of the nail, and extending up into its substance. It is not present in all the nails, the affected ones being those of the left thumb, middle finger, and forefinger, and those of the right thumb and little finger. In addition to the change in the nails themselves, there is beneath their free edges a considerable quantity of a soft substance, of a dirty yellow colour.

"The man states that he had a similar affection during the last two winters; that it came in the autumn, and went away in the spring. He has had chancres several times, and buboes, but not for the last twenty-four or twenty-five years. He has had rheumatic pains about the shoulders, &c."

He was ordered to take Potass. Iodid. gr. iij, ex Mist. Quin., ter die, and to apply a lotion of hyposulphite of soda to the nails.

Some scrapings of the nails were taken away, and I examined them microscopically with considerable care. I found distinct evidence of the presence of a fungus, although in no great quantity. Spores were seen, some aggregated together, some in short single or double chains. Some contained bright central spots, and one or two gave off delicate tubes, which were even branched. The accompanying wood-cut is from a sketch made at the time. The fungus elements figured in it were all



¹ 'Verh. d. phys.-med. Ges. zu Würzburg,' 1855, v, p. 102.

present in the same field, and do not include the whole of those seen in that field.

January 12th, 1869.—The nails are much better; the thickening of their substance is less. The way in which he has applied the lotion has been by soaking the nails in it for ten or fifteen minutes at a time.

March 30th.—He went on with the treatment until February 9th, and then ceased to attend. At the present time the nails are not at all thicker than natural, and they are perfectly smooth. There is just a trace of the yellow colour in the left thumb-nail and in the right little finger-nail, but this does not extend far into the substance of the nails. This part cuts somewhat softer, and is more friable than the healthy nail.

May 4th.—The disease is now apparently well.

11th.—There is now a yellow line stretching almost through the left middle finger-nail. I think the nail is there more friable than elsewhere. Since March 30th he has gone on regularly with the treatment.

With the exception of a case described by Neumann¹ I am not aware of any previously recorded case in which a parasitic affection of the nails has been found during life in a patient not suffering from any parasitic disease elsewhere. Neumann's case is that of a girl, æt. 26, who had for twelve years had a disease of the nails, which were thrown off five or six times every year and replaced by new ones. The affected nails were rough, of a dirty yellow colour, and projected like thick claws over the finger ends. They were easily movable on their beds. Some presented whitish transverse lines; others yellowish spots in and under their substance. The girl had no disease of the skin beyond eczema of the leg. The nails affected were all those of the right hand, those of the first, third, and fourth fingers of the left hand, those of the first three toes of the left foot, and of one toe of the right foot.

It was impossible not to notice the similarity between the yellow patches seen in my case last recorded and those which I had observed in the cases of parasitic disease previously alluded to, as associated with favus and other parasitic affections of the skin. The slight difference in colour appeared to be easily attributable to the comparatively small quantity of fungus which was present in the case of J. P.— I was, therefore, inclined to attach considerable importance to those yellow patches as indicating the existence of a parasite in cases of nail-disease. But subsequent experience has tended to show that a similar appearance may be met with in cases of psoriasis of the nail. The following case seems to be an example :—

¹ Op. cit., p. 346.

C. D—, æt. 69, came among my out-patients September 7th, 1869. He has had psoriasis (lepra) for two years; and different parts of his body, his knees, and his left elbow are now affected with it. For seven or eight years past his finger nails have been diseased; they are better at some times than at others; they are not painful.

At present, the finger-nails are somewhat quadrangular in form, thickened, flattened, and finely striated. Some of them are raised in some places, depressed in others, and some of them appear to be growing away from the roots. Nearly all are more or less of a dull yellowish brown tint, especially towards their distal extremities. Some have greenish black patches in them.

I have no notes of the results of any microscopic examination of the nails in this case, but I think it can hardly be doubted that the disease in them was of the same nature as that on other parts of the body, viz. ordinary psoriasis.

Psoriasis affecting the nails does not always give rise to appearances such as those above described. It often manifests itself by marking their surface with transverse grooves which seem to indicate that the growth of the nails from their roots has taken place by fits and starts, and not uniformly as under normal conditions. Mr. Hutchinson has figured an example of this kind in one of the plates published by the Sydenham Society, in which, however, some of the nails are also rough, brown, and striated longitudinally towards their free extremities. A somewhat similar case is the following :—

F. G—, æt. 31, came as an out-patient July 28th, 1868. For three or four years he has had a patch of psoriasis on one elbow. For about a month the disease has appeared, in the form of psoriasis guttata, on the backs of the hands and fingers. The nails are now marked with transverse striæ for about half their length from the root.

At the end of ten weeks, when the cutaneous disease was cured, the nails still remained rough. There was much heat and redness of the affected parts in this case; and the local application of the glycerinum amyli appeared to be of the greatest service, after other topical applications had failed.

The following is another case in which the nails presented yellow patches, somewhat similar to those observed in the case of parasitic disease described on p. 553. It is, however, remarkable in the circumstance that the extremities of the fingers, and apparently the phalanges themselves, were greatly enlarged, being as broad as thumbs :—

CASE.—*Affection of certain of the finger-nails, with great enlargement of the extremities of the fingers, and of the nails themselves, in their transverse diameter.*
—Lucy J—, æt. 32, living at Peckham Rye, came as an out-patient to the hospital

about the end of May, 1869. She states that about two years since she first noticed that the extremity of the right middle finger beyond the last joint was enlarged. As the nail grew it also became diseased, being of a darker colour than natural, uneven on the surface, and horny. At present, all the nails are affected, except those of the ring- and little finger of the right hand. They are slightly scaly and pitted on the surface, and present patches of a yellow colour. The enlargement of the ends of the fingers themselves does not affect all those of which the nails are diseased. It is most marked on the right, middle, and forefingers. It is entirely unlike the "clubbing" of the fingers which occurs in cases of thoracic disease; the increase is more marked in the transverse than in any other direction, the nails themselves being, perhaps, twice as broad as natural. The fingers are, of course, kept wide apart by the enlargement of their ends.

She was directed in the first instance to keep a solution of hyposulphite of soda (5j—3j), constantly applied to the nails, and to take a mixture containing three minims of Liquor Arsenicalis three times a day.

On June 22nd, the medicine was changed to three grains of iodide of potassium three times a day, and a week later the dose of the iodide was increased to ten grains.

20th.—The patient says that she now experiences much less heat and pain in the nails than before. The enlargement of the finger-ends remains unaltered; the left little and ring fingers now present a lateral enlargement over the base of the phalanx, although the extremities of the fingers themselves are not bigger than natural. The bone can be felt to be enlarged. This, she says, has been increasing lately. The nails seem to be growing more naturally at their roots, and the worm-eaten appearance is not so marked.

27th.—Ung. Hydrarg. mitius (one part of strong blue ointment to three of lard) to be applied to the finger-ends.

October 5th.—Since the last report she has been taking ten grains of iodide of potassium in mist. ammon. t. d. until the last fortnight. She has been applying lotio plumbi, with lint and gutta percha to her fingers. She did not long continue to use the ointment. She thinks her nails are improving in appearance, but there are still some yellow spots forming in them. She now experiences no pain; and, although the finger-ends are not diminished in size, she thinks that the progress of the enlargement may have been checked.

The *affections of the nails produced by acquired syphilis* have not yet, I think, attracted as much attention as they deserve. They were, indeed, formerly studied by Cazenave, and a section of the work of Lancereaux is devoted to their consideration.¹ But the opinions of most observers would, I think, be found to coincide with that of Mr. Hutchinson,² that the nails are very rarely involved in the course of secondary syphilis.

As might be expected, the cases in which the nails are affected are chiefly those in which the palms and soles are the seat of a scaly syphilide—the so-called psoriasis palmaris et plantaris.

¹ "Treatise on Syphilis," 'New Syd. Soc. Trans.,' vol. i, p. 157.

² 'Path. Trans.,' xiii, p. 259.

Mr. Hutchinson gives an instance of this kind ; and the following case is an example of a similar occurrence.

A. B—, Esq., a gentleman about 50 years old, came to me January 25th, 1869, on account of a disease of the nails, which had been coming on for about twelve months, having begun in the fore and middle fingers of the right hand. It subsequently appeared in the fore and middle fingers of the left hand ; these have been affected about three weeks. On examining the nails I found that their surface was slightly concave (instead of being convex), rough, and of a black colour. They looked as if growth from the root had been entirely checked, and as if the existing nail consisted merely of an irregular mass formed from the bed.

This gentleman had been a patient of Mr. Hilton's, who had been treating him for an affection of the palms of the hands, and who sent him to me. The tongue was large and red, presenting white spots on its surface, but no fissures. I was of opinion that the disease of the nails was of syphilitic origin ; but, finding that he had been taking iodide of potassium for a considerable time, I thought it would be well to combine some arsenic with the mercurial medicine, which I believed would be beneficial. I therefore prescribed Liq. Hydrarg. Bichlorid. ʒij, Liq. Arsenici Hydrochl. ml, Tinct. Cardam. co. ʒj, Aquæ ad ʒiv. "Two drachms to be taken twice a day in some water." Ung. Hydrarg. ʒj, Ol. Lavandulæ mʒ, Ung. Creasoti ʒvj, M. ft. Ung. "To be applied to the roots of the nails every night."

The quantity of arsenic was subsequently increased. On March 23rd I noticed that there was a decided though slight improvement in the nails, which appeared to be growing more healthily from their roots. Their surface was still rough, but less so towards their attached ends, and their colour was paler. I now obtained for the first time a history of syphilis. The patient had, it appeared, had a chancre twelve years before, followed by "an eruption like ringworm." His tongue was now smaller, but still required the occasional application of Argent. Nitr., which Mr. Hilton had ordered for him. I now determined to omit the arsenic, and to trust to the use of mercury alone. ʒ Liq. Hydrarg. Bichlorid. ʒij, Extr. Sarzæ Liquid. ʒij. A teaspoonful to be taken with twenty or thirty drops of tincture of cinchona twice daily.

He continued this treatment for a month, and then left it off for six weeks. On June 17th he again called on me. The improvement was more marked, especially in the left forefinger nail. To go on with the same medicine as before.

August 27th.—Since his last visit he has steadily persevered with the medicine. The nails are slowly improving. The right forefinger nail is still black and somewhat rough, but the growth from the root is now marked, although linear striæ still make its surface uneven. The nail in which the improvement is most marked is that of the left forefinger. One of the toe-nails, however, has recently commenced to manifest a similar disease to that in the finger-nails. ʒ Acid. Nitrici diluti ʒiij, Tinct. Cinchonæ ʒv. Thirty or forty drops to be taken twice a day.

November 1st.—There is still steady improvement. The forefinger-nail is no longer black, and it has even begun to form a free edge, projecting over the finger-end. He now complains of an ozæna-like fætor of nose ; and there is some visible redness of the mucous membrane. He has omitted the medicine during the last month. ʒ Potassii Iodid. ʒj, Tinct. Gentian. ʒiij, Infus. Gentian. ʒvj. A sixth part to be taken twice a day.

A case very similar, but in which the affection of the nails

was present in a still more extreme degree, has been recently under my care in the clinical ward, and the appearances have been modelled by Mr. Towne.

FROM NOTES BY MR. MALLAM.*

S. B.—*et. 31.* Living at Ipswich. was admitted March 25th, 1869. She is a married woman: she has had two children, both alive: she has never miscarried.

She denies ever having had syphilis, and excepting the affections of the skin and nails, the only symptoms which she acknowledges, and which could be ascribed to a syphilitic taint, are that she has occasional sore throats, and frequently suffers from some frontal headaches. She states, however, that in July last year, she washed for a longer while she afterwards discovered to be ill. In the course of the same month she noticed a soreness at the root of the nail, and at the tip of the thumb of her right hand. A week later she found that her other thumb and all her fingers were becoming affected in a similar way. In about a month or six weeks, the toe nails also became affected, and at this time she observed that her finger nails were unusually growing thicker. Soon the heels and the plantar surfaces of the toes, as well as the palms of the hands, became thick, scaly, and cracked.

In appearance she appeared a healthy looking woman, but said that she had lately suffered from sudden general sweats and flushings of her face. Her tongue was slightly furred and brown.

The nails of the fingers were raised into thick, black, rounded, narrowed, claw-like bodies, projecting perhaps a quarter of an inch above the dorsal surface of the fingers. Towards their roots they were paler, being of a yellowish colour, but they were quite equare, and very rough, without any definite striæ such as are sometimes seen. The folds of skin on the roots of the nails were slightly thicker than natural, and tender, but not inflamed. At the other end of the bed of some of the nails, the disease seemed to extend from the nail itself to the skin over the pulp of the finger (or thumb, as the case might be).

The toe nails were also very thick and prominent, except that of the 2nd toe of the left foot.

The palms of the hands presented rough and chappy patches; and the skin round these was redder and smoother than natural, but without definite macules.

The cuticle of each heel, and also of the anterior half of the sole of each foot, was thick, forming large scaly patches, with rather deep fissures in some places. There was a good deal of tenderness on pressure, especially on the heels. There was also some pruritus.

Both the uvula and the lateral regions of the throat were decidedly reddened.

On April 10th, Mr. Mallam shaved down several of the nails, and applied some ung. hydrarg. mitius about their roots. This application was continued, and she took Potass. Iodid. gr. iij. ex Mist. Hydrarg. Bichlor. t. d.

On the 16th, she complained of great headache, faintness, and giddiness. The gums were sore, and she had a metallic taste in her mouth. To omit her medicine; and to wash her mouth with a gargle, containing Tinct. Iodini ʒss ad Aq. Osa.

* This disease must not be confounded with that described by Virchow under the name of *Onychogryphosis* ('Würzb. Verh.,' 1855, p. 88). The latter is a mere local affection, occurring in the toe-nails only, and apparently caused by pressure.

On the 19th, her mouth was well, and she resumed her medicine.

April 26th. "The palms of the hands are much better. There is only one patch on each hand at all scaly; all the others are merely dry stains. The feet also are much improved. The nail has come off the right little toe, leaving an apparently healthy surface. To discontinue the ointment; R Glycerini Amyli, 3j; Camphoræ 3j; Sp. Vin. Rectif., q. s., "to be applied to the affected parts."

On May 8th, she was seized in the evening with a sharp attack of laryngitis, attended with great restlessness and a croupy cough. T. 99·6; P. 106; R. 24. She was ordered an emetic, and a mixture containing Vin. Antim. ℥xv, ex. Mist. Amm. Acet. every four hours.

May 9th, 9·30 a.m. Respiration much less noisy. T. 100; P. 112; R. 32.

May 11th. p.m. T. 99; P. 112; R. 28.

On May 12th she was well enough to resume the Mist. Hydrarg. Bichloridi. "While she was so ill, she omitted to use the Glycer. Amyli, and her feet became very irritable. She has now resumed it, and they are much better."

May 18th, she left the hospital much relieved, so far as her hands and feet are concerned. "The palms are nearly well, and the fingers are much less irritable. The finger-nails appear to be growing much more healthily from their roots."

She continued to attend as an out-patient, and on June 9th her nails are noted to be "coming up more healthily. The palms are quite well; the feet still very sore."

Besides this severe and troublesome affection of the nails it appears probable that the outbreak of constitutional syphilis may cause those curious transverse lines on the surface of the nail, which were some years ago described by M. Beau,¹ and which have recently attracted so much attention in consequence of an article by Dr. Wilks, which appeared in the first number of the 'Lancet' for the year 1868. The following appears to be a case in point:—

CASE.—H. F—, æt. 32, came as an outpatient to me on December 10th, 1868, with a narrow circumscribed ring on his nose, and with partial alopecia. The affection of the nose quickly disappeared under treatment with Mist. Hydrarg. Bichlor. He had had a chancre about the month of July previous.

On January 31st, he pointed out to me that the nails presented a peculiar appearance. Many of them, in fact, had a little transverse groove running across them, at about the same distance from the root in the case of each nail. The nail was more raised in front of the groove (towards the free end of the nail) than behind it. The nails themselves were smooth, and of natural colour, but, perhaps, a little thickened. The fold of cuticle under the nails was also a little thicker than natural.

An appearance almost precisely similar to that met with in the cases referred to by M. Beau and Dr. Wilks has been represented by Mr. Hutchinson in one of the figures in his plates above referred to, and this figure is by him described as one of "*heredito-syphilitic onychitis* in an adult." From the history it would appear that the patient was distinctly affected

¹ 'Archiv. Gén. de Méd.,' 1846, sér. iv, t. xi, p. 447.

with hereditary syphilis; but I cannot help doubting whether the affection of the nails was really due to this cause. There is indeed an obvious inconsistency in the report. The nails are said to have been affected for a year; but they are represented as marked each by a single transverse groove, quite close to the root, and at just about the same level in different nails, which groove must necessarily have been cast off in their growth. It is true that these nails are slightly fissured (but only *very* slightly) towards their free edges. Is it not much more probable that the nail affection was the result of some acute disease through which the patient might have recently passed?

During the present year a model has been added to the Museum of this appearance of the nails as it was observed in a girl who was a patient of Dr. Wilks', and who had recently had scarlatina. In this instance, as seems always to be the case, the groove was so inclined that it could be felt much more plainly by passing the finger over the nail towards the free extremity than in the reverse direction. It seems as if, the growth of the nail having abruptly ceased for a time, a new lamina is formed *beneath* and *behind* it, lifting it up.

In conclusion, I may refer to the following case, of which a model was made by Mr. Towne, and which was sent by Mr. Bryant into the Clinical Ward, at first under Dr. Wilks', and subsequently under my care. No positive diagnosis as to its nature was ever made, but it was considered by some that the affection was allied rather to Elephantiasis Græcorum than to any other disease.

Case.—*Grooving of the fingers and finger-nails, associated with slight thickening of the skin of the face and arms, allied to Elephantiasis Græcorum.*

Reported by Mr. F. TAYLOR.

E. A., æt. 33, admitted under the care of Dr. Wilks, into Miriam Ward, March 11th, 1868. She stated that she had been quite well until four years ago, when her fingers began to get numb. The numbness was at first confined to their tips, but it afterwards affected them in their whole length, and even the distal portions of the hands. Its onset was preceded by a severe cold, with much general pains. The numbness and weakness were such that she could not hold a pin or a needle, and dropped anything she attempted to carry. The right hand was rather worse than the left. The colour of the fingers was accused to change several times in the course of the day. Sometimes it was whiter than natural, at other times it was bluish-black. The latter appearance was caused by cold: and if she sat before a fire, the fingers would regain their healthy appearance, or become whiter. A slight chill was very painful, and warmth caused tingling and "pins and needles" up to the elbow

or shoulder. She suffered more in the winter than at other seasons. About twelve months ago the nails began to come off. Those of the right little finger, and the left middle finger, have already been shed. One nail has been in the act of coming off for three months. During the last four years her health has been weak, but she has not been laid up. She is a married woman, and has had seven children.

Three months ago she got a little better for a time, and was able to use her fingers. But in January last the pains came on again, and were so severe that she came to Guy's Hospital as an out-patient under Mr. Bryant. For the last four weeks the third toe of the right foot has been numb and painful. She at first supposed that this was due to a chilblain, but for the last fortnight it has presented the same appearance as the fingers. The treatment ordered by Mr. Bryant consisted of tonics and good diet.

On admission, her condition is as follows:—On the right hand the thumb and little finger are sound, the thumb being, however, of a bluish colour. The nails of the middle and ring fingers are compressed laterally, the tips of the fingers being contracted under them. The nail of the ring finger is in process of being shed, and that of the middle finger looks dead and ready to be cast off. The skin over the ungual phalanges is of a pink colour, tense, and shining. The last two joints of the fore finger are inflamed, with discharge of pus from under the nail; the nail itself is white and hard looking. There is no enlargement or swelling of the ends of any of the fingers.

Of the left hand the fore, middle, and ring fingers are inflamed. The nails of the fore and middle fingers are dull and scaly; that of the little finger is compressed laterally. The thumb and little finger are sound, but of a bluish colour. She has shooting pains in the hand, extending to the elbows. Sensation is not entirely lost in the fingers, but it "soon becomes deficient."

The third toe of the right foot is affected in the same way as the fingers.

The skin of the face is very dark, hard, brawny, not easily pinched up. She says that if she gets at all excited, her lips and tongue feel stiff and hard. She is also conscious at such times of stiffness in her cheeks.

The skin of the arms is in a natural condition.

The internal organs appear to be healthy. She has not menstruated since her last child was born, fourteen months ago; it is only a month since she weaned it. Urine sp. gr. 1012, pale.

She was ordered to take *Mist. Quinæ* ʒj, t. d.

On March 18th it is noted that the nail of the left forefinger fell off on the 13th. There is some discharge from the tip of the finger. She has been applying linseed poultices to the hands.

On March 26th the nail of the right forefinger had fallen off. The tips of the fingers were very painful. She said that the sense of touch was less impaired than on admission.

April 8th.—The fingers are very painful, especially those from which the nails have recently fallen. The skin of the fingers is red, tense, and glazed as before. She is applying water dressing.

On April 15th she left the hospital.

THE RESULTS OF
AMPUTATIONS OF PORTIONS OF THE LIMBS,
ON ACCOUNT OF
INJURIES AND DISEASES,
ESPECIALLY IN REFERENCE TO THE
CAUSES OF THE MORTALITY
AFTER SUCH OPERATIONS.

BY JOHN BIRKETT.

IN the following pages I have recorded the results of the removal of parts of the upper and lower extremities with the knife and saw.

All the patients have been under my immediate supervision. I have not performed every amputation myself, but in by far the majority of instances it has been my lot to do so. Every patient was in one of the wards of Guy's Hospital, and as I have always kept notes of the cases, the accuracy of the facts here recorded may be implicitly relied upon. Besides, the principal features to which I am anxious to call attention, namely, the causes of death after amputations of the limbs, are substantiated by the post-mortem examinations of many of the patients. Those investigations were faithfully carried out by gentlemen appointed from time to time to make them, and record what they saw. Most of the cases were taken by the dressers or reporters, sometimes by both, as well as myself, and the accuracy of the numbers under my care and the final results have been tested by reference to the admission and exit Register kept by the Hospital Authorities.

I am fully aware that the inquiry cannot claim the notice of the profession by the attractive charm of novelty. Twenty-six years since, Dr. Norman Chevers published a most valuable

paper in this Serial, in which it was shown that the mortality of patients after injuries and surgical operations was due "to the influence of a diseased state of their abdominal organs to which their previous habits of life have long been subjecting them."¹ The facts upon which the conclusions arrived at in that paper were based, were derived from a careful analysis of the records of the post-mortem examinations made by Dr. Hodgkin and Mr. T. Wilkinson King.

The cases here related extend over a period of seventeen years.

The total number of operations was 175; but double operations were performed on *four* individuals, one of whom was cured, three died.

The injuries of those that died were as follows :

1. An unhealthy man, aged 45, was knocked down by a railway engine; both legs were crushed below the knees; amputation of the injured parts of the extremities was performed through the right femur and the left tibia and fibula. He never rallied from the shock of the injury, but he survived to the third day.

2. A man, aged 18, was knocked down by trucks, the wheels of which passed over both legs. It was necessary to amputate through both femurs. He survived the injury a few hours only.

3. A healthy-looking man, aged 36, had his left leg and left arm crushed by the wheels of railway trucks passing over them. Primary amputations were performed through the left femur and humerus. He rallied from the injury, and for a few days seemed likely to recover. Both stumps then became inflamed, and there was profuse suppuration, without, at first, great constitutional disturbance. On the tenth day after the injury he had a very violent rigor, and in one of the shivering fits he died, only ten hours and a half after the first rigor. This statement was verified by Mr. Eastes, the registrar. There was no after-death examination.

The next case, one of double amputation, which was cured, has been reported by Mr. Richard Talbot.

¹ 'Guy's Hospital Reports,' 2nd series, vol. i, 1843, p. 94.

4. In September, 1861, a hardy, healthy, and temperate labourer, twenty years old, was knocked down by some railway trucks, the wheels of which crushed his left humerus and left femur in their passage over them. He was brought into the hospital soon after the infliction of the injury, and amputation through the shaft of the humerus and through the femur was immediately performed. The man was under the influence of chloroform. The soft parts about the femoral stump were contused, and the muscles torn and slightly detached from the bone. After recovering from the chloroform he became exceedingly restless, vomited all he swallowed, and was excessively depressed. Opiates and stimuli were administered.

The following day his condition was greatly improved. He had slept a little during the early morning, and was able to retain food in his stomach. Stimuli and opium were continued. He daily progressed satisfactorily, until about the eighth day after the injury, when great constitutional disturbance arose, the femoral stump becoming inflamed and at last sloughing. This occurred at the posterior region in the site of the injured muscles before described. Profuse suppuration followed, attended with great exhaustion and depression, and for some days there appeared to be very slight chance of his recovery. During all this time, however, the stump of the humerus healed slowly.

At the end of the month his general state was greatly improved, the arm stump nearly well, and the purulent discharge from the thigh was diminishing. During October the improvement was rapid, and he left the hospital well.

Thus of the three fatal cases two were killed. The third died on the tenth day after the injury, under those conditions of acute constitutional disturbance which indicate inflammation of a large serous surface, or the formation of suppuration in a vital organ.

Excluding the four double amputations there remain 167 single amputations upon that number of individuals.

A summary of the general results is given in the following table; from which it will be seen that the mortality was 31·73 per cent. : or, not quite one in three individuals died, from the

Immediate result of the injury, or of disease, after the operation performed in consequence of one or the other.

Amputations.

	Total.		Cured.		Died.
Through Femur	73	...	50	...	23
„ Tibia and Fibula.....	43	...	27	...	16
„ Humerus.....	26	...	14	...	12
„ Radius and Ulna.....	25	...	23	...	2
	<hr/> 167		<hr/> 114		<hr/> 53

DIVISION I.—OPERATIONS ON THE LOWER EXTREMITY.

A.—*Amputations through the Femur.*

We shall now proceed with the analysis of the special kinds of operation in the classes already given, but separating those cases in which the operations were necessitated by injuries from those in which the operation was done on account of disease.

After 73 amputations through the thigh bone, 50 patients recovered, 23 died.

Amputation was performed in 19 cases on account of injuries, and in 54 for disease.

The mortality was as follows :

	Total.		Cured.		Died.
For injury	19	...	6	...	13
For disease	54	...	44	...	10

I.—*Amputations through the Femur after Injuries.*

Amputation through the femur was performed on account of injury to the bone itself, or of the member below the knee. Thirteen cases died. The causes of death were the following. Five we may regard as killed by the injuries inflicted, as they only survived them a few days. After death examinations were not made of any of them.

1. A child, aged 5, with compound comminuted fracture,

and laceration of both legs, survived the injury only a few hours.

2. A man, aged 31, admitted with compound fracture of the femur, for which primary amputation was performed, died a few hours afterwards.

3. A brewer's drayman, aged 42, very large and fat, had compound comminuted fracture of the tibia and fibula. Great constitutional disturbance followed, the limb sloughed, and on the third day after the injury secondary amputation through the femur was performed. He never rallied, and died on the fourth day after the injury with the stump gangrenous.

4. A labourer, aged 21, was admitted, as Mr. J. W. Bushell reports, in consequence of a severe compound fracture of the tibia and fibula, which was produced by a heavy piece of iron falling on the limb. An attempt was made to save it, but, on the evening of the following day, symptoms of delirium potatorum appeared, which became marked the next day. On the third day from the injury amputation through the femur was performed, but in spite of every attention he died the next day. It was stated that he was addicted to excessive drinking of spirits.

5. A male, aged 53, was admitted with a compound fracture of the femur. Secondary amputation was performed on the fourth day from the injury, and he sank on the fifth. This man had been out of health for more than a year, suffering from rheumatism in the joints. He was knocked down in the evening by two men, who, falling upon him, broke the left thigh bone, the fracture extending into the knee joint. They afterwards carried him behind a straw stack, where he remained during the night. He travelled about six miles to the hospital. No post-mortem examination.

The following cases survived the injury a longer period.

6. A child, aged 5, admitted with compound fracture of the tibia and fibula, for which secondary amputation was performed on the ninth day after the injury, survived to the twelfth. No post-mortem.

7. An emaciated man, aged 65, a gin drinker, was admitted on account of a compound comminuted fracture of the tibia and fibula. Primary amputation through the femur was performed. The case was reported by Mr. R. C. Lucas. Five

days after the operation the stump sloughed. The pulse was small, irregular, 87. Tonics and stimuli had been given, and were continued. Two days afterwards the surface of the stump was improved in appearance, but the nights were restless, and pulse 98. Ultimately the flaps sloughed, distressing hiccough supervened, diarrhoea set in, and he sunk from exhaustion on the twenty-eighth day after the injury. A post-mortem examination was refused. The urine of the patient was examined; but it afforded no indications of organic disease of the kidneys. Its specific gravity was 1017, and it contained phosphates.

8. A labouring man, aged 35, received a severe contusion of the leg, causing extensive sloughing of the integuments. On the seventeenth day from the injury amputation through the femur was performed. The stump sloughed, the ligatures, all of them, came away; cicatrization was advancing, when secondary hæmorrhage took place from the femoral artery. This vessel was again secured with a ligature, and no more bleeding took place. However, the loss of blood caused exhaustion, and he died on the thirty-first day after the injury, and the fourteenth from the amputation. No post-mortem examination.

9. A male, aged 40, was knocked down by a cab, the wheels of which passed over his right thigh. These notes are from the report of the case taken by Mr. Lionel Burrell, dresser. The femur was broken just above the condyles, opposite to which was a lacerated wound on the inner and posterior aspect of the thigh. The broken bone could be felt through the wound, and it was comminuted. There was a moderate amount of bleeding, chiefly venous, and pulsation in both anterior and posterior tibial arteries near the ankle-joint was distinctly felt. Besides the above injury, the external malleolus of the left fibula was broken, and there was a compound fracture of the left little finger, with contusion of the left elbow.

The man appeared to be in average good health. For the last ten years he had been temperate, but confessed to have been a drinker in his earlier life.

The wound was dressed with moist strips of lint. The fragments of the femur were adjusted and kept in position with a straight splint. Liberal diet was allowed with stimuli in moderation.

The constitutional disturbance following the injury was not

severe. His condition from the first was rather one of depression than attended with the usual reaction. Four days after the injury the wound was sloughing, the pulse weak, very rapid and jerking. He slept fairly, took food with appetite; but he rapidly became thinner. In this condition he remained for about fourteen days, varying slightly from day to day; the wound discharged freely, and in some parts showed a disposition to throw off sloughs. During all this time stimuli were given with nourishing diet. On the twenty-second day from the injury profuse bleeding occurred from the wound during the night which, however, ceased spontaneously. His powers were very much reduced by this untoward event, and it was deemed expedient to await their restoration, or a recurrence of bleeding before amputating the member. The next day, while dressing the wound this occurred, and I performed amputation through the middle of the femur. This bone was very dense, hard, and enlarged. The blood scarcely coagulated, being very thin and watery. The man did not fully rally from the effects of the operation, and died a few hours afterwards. He survived the injury to the twenty-third day.

The femur was broken obliquely across, a little above the condyles, and a vertical fracture between the condyles extended into the joint. They were now separated from each other, and disease was commencing in the joint.

The coats of the popliteal artery were thicker than usual, and a ragged opening, half an inch in diameter, filled with coagulum, was found.

Dr Wilks' report of the necropsy is as follows. (1861, No. 127). Many of the bones were much hypertrophied, as if affected with osteitis. The right femur at the section was enlarged and the bone very dense. The medullary cavity closed by bone. The left femur was also thickened and both clavicles enlarged. The calvarium was very irregular on the outer surface from elevations and depressions. This appeared to be due not so much to hypertrophy as to new bone. Probably an external caries or necrosis had taken place, and new bone had formed. The pericranium was absent in parts, and fibrous tissue existed in the depressions. In one or two places this tissue appeared to penetrate to the internal table. The dura mater was very adherent. In the right optic

thalamus was a small cyst, about three quarters of an inch in diameter, filled with fluid, its walls smooth and traversed with blood vessels.

The heart contained an unhealthy amount of fat. The liver was very fatty. The gall-bladder held a large gall-stone. The kidneys were pale, large, soft, and fatty. The lungs were healthy.

10. A country labouring man, forty-one years old, was admitted on account of a compound dislocation of the left knee-joint. The injury was inflicted about sixteen hours before his arrival. He had travelled in a light spring-van a distance of about thirty-two miles in eight hours. Very little blood was lost, as the principal vessels were not torn. A large wound existed in the popliteal space, through which the condyles of the femur projected. (Drawing in Museum 33³⁸.) The patient was placed under chloroform, but attempts to reduce the dislocation failed. The injury to the soft parts being severe, it was considered necessary to amputate through the femur. He progressed very favorably for sixteen days. All the ligatures had come away and the stump was healing. Severe constitutional symptoms then arose, indicative of visceral complications, and he died on the twenty-seventh day after the infliction of the injury.

An examination after death showed that both lungs at their posterior surfaces were consolidated, and in places breaking down so that puriform fluid flowed from sections of them. Lobular consolidation existed in other parts.

The muscular structure of the heart was very weak, and the left ventricle dilated. All its cavities were larger than normal. Valves healthy. The liver was large, ecchymosed, here and there soft. Both kidneys were very large and coarse, the left contained numerous cysts, some holding yellow fluid contents, others an amber-coloured, gelatinous, soft solid substance.

The femoral vein, for three inches below Poupart's ligament, and the external iliac vein, contained an old adherent fibrinous clot, but no pus was detected there. The calibre of the vessels was not blocked up entirely by it. A portion of the surface of the stump was sloughing.

11. A resident in the borough of Southwark, aged 45 years, formerly a cook, of late a shirt maker, was tipsy when she was

thrown down in the street. A man falling over her caused a compound comminuted fracture of the right tibia and fibula. She was emaciated, sallow, aged looking, and her muscles relaxed and flabby. She would not consent to the loss of the limb when first proposed; but within twenty-four hours after the injury was sustained I amputated through the femur, as the injured tissues would not admit of the section being made through the tibia and fibula with any probability of a good result. The tissues of the stump soon began to slough, and without showing any marked indications of repair, although she survived to the twenty-fourth day, she at last sank. There was no post-mortem examination, but the indications of fatty degeneration of the tissues were very marked.

12. A man, aged 53, enjoying good health, and said to be temperate, fell from a height of 25 feet to the ground. He was admitted soon after the infliction of the injury, which was a compound comminuted fracture of the left tibia and fibula, and considerable laceration of the soft parts around. The arteries, however, being uninjured, hopes were entertained that the member might be saved. A fragment of tibia was removed and a piece sawed off the upper fragment. The limb was placed in position, and in a few hours he did not complain of much pain. For some days his appetite continued good; he slept well; the pulse was soft and compressible. Profuse suppuration then appeared; the ends of both fragments became bared of periosteum, the upper one for two inches, the lower, one inch. Secondary amputation through the femur was performed on the seventeenth day after the injury. The stump sloughed, profuse suppuration continued, rigors, rapid pulse, exhaustion supervened, and death occurred thirteen days after the operation and thirty from the receipt of the injury.

The report of the necropsy, by Dr. Wilks, is as follows:—

In the right pleura half a pint of purulent serum and a layer of lymph, covering the lower lobe of right lung. In this lobe there was a circumscribed mass of pneumonia, about three inches in diameter, which corresponded to the patch of lymph on the pleura. Both lungs collapsed.

Heart flaccid; a loose clot in right side not decolorized, and same in left.

Liver healthy. The kidneys nearly so, except a few small

cysts on their surface. Surface of flaps on stump sloughing, but sloughing not extending up the leg.

The femoral artery and vein closed by a clot, the vessels empty. No coagulum nor trace of inflammation within them. (Necropsy, 1854, No. 126.)

13. A man, 42 years old, a plumber by trade, living and working in a suburb of London, and habitually of dissipated habits, according to the testimony of his relatives, was admitted on account of a compound fracture of the left tibia and fibula. A heavy piece of metal fell on to the limb, which contused the soft parts rather extensively. The tibial arteries, however, pulsated on the foot, and attempts were made to save the limb. The following notes are condensed from the report of the case by Mr. H. Couling.

The limb was placed in an extended position after the adjustment of the fragments, and for several days he seemed to be progressing very favorably. Suppuration, however, became at last established, and a large collection of pus having formed on the outside of the leg an incision was made to allow of its escape. On the twenty-second day from the injury, considerable bleeding took place, of a venous character. It was arrested, but recurred slightly on the next day, and the day following. During the time preceding this occurrence he had been well supplied with nourishing diet, stimulants, and ferruginous tonics, with occasionally an opiate at night. Amputation through the femur was performed on the 24th day from the injury. An examination of the leg showed that the anterior and posterior tibial veins had sloughed. This patient made a fair progress towards recovery for a few days, then the stump sloughed, attended with the usual constitutional symptoms. He rapidly became exhausted, and died on the 48th day from the injury, and the 24th from the operation. No necropsy.

Summary of the cases in which amputation through the Femur was performed on account of irreparable injury and its consequences, or traumatic amputations.

The total cases, nineteen.

Primary operations nine cases, of which four were cured; five died, two of these being "killed" by the injury.

Secondary operations ten cases, of which two were cured; eight died, three of these being "killed" by the injury.

Now, as five were "killed" by the immediate effects of the injury, fourteen patients survived those consequences, with whom a chance remained of saving life.

Thus arranged the summary will stand:—

	Cured.		Died.		Total.
Primary	4	...	3	...	7
Secondary	2	...	5	...	7
	<u>6</u>		<u>8</u>		<u>14</u>

The causes of death were as follows:—

Case.	Age.				
6	5	F.	S.	...	Exhaustion. ¹
7	65	M.	P.	...	Sloughing stump, diarrhoea, exhaustion.
8	35	M.	S.	...	Sloughing stump, secondary hæmorrhage from femoral artery.
9	40	M.	S.	...	Hæmorrhage before amputation, exhaustion, fat heart, liver, and kidneys.
10	41	M.	P.	...	Inflammation of both lungs, diseased liver and kidneys.
11	45	F.	P.	...	Drunkard. Fatty tissues, every appearance of diseased viscera.
12	53	M.	S.	...	Sloughing stump, rigors, pleuro-pneumonia, diseased kidneys.
12	42	M.	S.	...	Dissipated habits. Hæmorrhage, sloughing stump, exhaustion.

It may be here noticed that six of these patients had reached forty years and upwards, which is a time of life when the social habits of individuals begin to exert a strong influence on health.

The "traumatic" amputations through the femur, after which the patients recovered, were the following:—

Primary, four.

1. A woman, aged 45, and very stout, who had lived very well, after compound comminuted fracture of the tibia and fibula.

2. A male, aged 18, for crushed leg.

3. A male, aged 6, for wound into knee-joint.

¹ M. stands for male. F. for female. P. for primary amputation. S. for secondary amputation.

4. A male, aged 24, compound fracture of the tibia and fibula.

Secondary, two.

1. A female, a country girl, aged 17, after extensive laceration of the leg and thigh by machinery, in which the integuments sloughed.

2. A male, a country lad, aged 13, after compound fracture of the femur, with extensive laceration of soft parts.

II.—Amputations through the Femur on account of Disease.

14. A cachectic woman, aged 32, was the subject of "phlebitis" after parturition, subsequently to which the knee-joint became affected, and at last disorganised. Amputation through the femur was performed, the stump nearly healed, but she sank from exhaustion. She survived the operation to the twenty-third day. At the necropsy made by Dr. Wilks (1861, No. 145) the pericardium was found universally adherent by delicate cell tissue. There was much fat on the surface of the heart. The liver was fatty. Softened coagulum was seen in the iliac veins extending into the cava. The vein of the stump was quite blocked.

15. A housemaid, aged 22, had been ill eleven months when admitted into the hospital. She came from a village in Essex. The left knee began to swell five months before, and the pain produced on moving the joint had existed the same time. She was very pale and emaciated. There was some disorganization of the joint, probably ulceration of the cartilages and pus within the capsule. The acute symptoms having subsided by rest and general treatment, there seemed to be a chance of saving the member. She did not, however, gain strength, and was never able to leave the bed. After being in the hospital about five months, the joint became much inflamed, her nights were much disturbed, and the powers of her constitution declined. She lost her appetite, and became desponding. Under these circumstances amputation was performed. She was greatly prostrated by the effects of the chloroform and the vomiting which followed; she could not retain even stimuli, and she sank exhausted on the second day

after the operation. Throughout the whole of the illness there was an unusual amount of nervous prostration, which seemed to be very much induced by constantly dwelling upon her helpless condition, to which the loss of her limb added. The knee-joint was entirely disorganized.

Dr. Wilks, who made a post-mortem examination, found no remarkable visceral disease (1863, No. 9), with the exception of a fatty liver. There was only one kidney.

16. A man, 19 years old, emaciated, cachectic, was admitted with disease of knee-joint of three years' standing. Sinuses on the outside and inside of the joint from which pus escaped led to dead bone. It was clear that a part of the lower end of the femur was necrosed. He had been always subject to a violent cough since childhood. Thinking that the removal of the local cause of suffering might afford relief, I amputated through the femur. He progressed very fairly for a few days; he was then attacked with severe diarrhoea, the cough became much worse, attended with profuse expectoration, and he died on the 14th day after the operation.

Necropsy by Dr. Wilks (1863, No. 110). The lungs filled the chest. The bronchial tubes were full of mucus and the smaller ones dilated. The lung tissue was firm, congested, and in some parts apparently collapsed. The lungs exactly corresponded to the same organs in children who have died of bronchitis. There was neither disorganization nor tubercle. Other viscera healthy.

17. A provincial publican, 28 years old, had been the subject of disease of the right knee-joint for four years, when he came into Lazarus ward under my care. Mr. C. V. Bennet was the dresser of the case, and Mr. F. M. Cann reported it. His general health was much impaired. During the first year or two he suffered intermittently from pain and stiffness of the joint. A few months since, after working in a damp cellar, it became much worse, and he was obliged to give up work. There were all the indications of ulceration of the cartilages, and suppuration within the capsule with disease of bone. His constitutional powers beginning to fail, I amputated through the femur. Great depression followed the operation, and nausea with occasional vomiting did not cease until five days after. About a week after the amputation, great constitutional

disturbance was excited, pulse 140, pains all over the body, entire loss of appetite, hot skin, but without rigors. He fell into a typhoid state and survived the operation to the 12th day.

18. A very delicate, unhealthy-looking man, aged 24, had been suffering more or less for three years with disease of the right knee-joint when admitted under my care. Mr. Vawdrey was the dresser, and Mr. Edward Evans reported the case. All the indications of acute disorganization of the joint were marked. After repose, constitutional treatment and the application of mercurial ointment, the inflammation in the joint partially subsided. An incision was made into the joint, pus escaped, and two loose pieces of bone were removed. For a few days relief was afforded by this treatment, but he relapsed into his former state of suffering, sleeplessness, and loss of appetite. Amputation was performed through the femur, and for some days there seemed to be a chance of his recovering. On the fifth day after the operation, secondary hæmorrhage occurred, the flaps were separated, and a bleeding vessel secured. Three days afterwards there was more bleeding, which was arrested by direct pressure on the stump. The loss of blood and attending circumstances depressed him very much, and although he rallied to a certain extent, he gradually after a few hours became very exhausted, and died on the twenty-second day after the operation. There was not an after death examination, but there was reason to believe that the lungs were affected by recent as well as chronic disease.

19. A man, aged 48, was admitted on account of disease of the left knee-joint. He was in a most cachectic, worn-out condition, and was the subject of pulmonary disease also. The joint had been diseased many months and was now disorganized. After constitutional and local treatment he improved in health and the joint gave him less pain. He then suffered from an attack of pleurisy and pneumonia of the bases of both lungs. From this illness he recovered. When he had been free from the pulmonary disease above mentioned about one month, I amputated through the femur. The man bore the operation fairly well, and for some days, the results of the removal of the source of constitutional disturbance seemed likely to be good. At the end of about three weeks he complained again of his

which in passing became more and more brown and in 1885 he became and remained gradually weaker and weaker until in the winter of 1886 he died after the amputation of the right leg.

In 1887 H. F. Smith made an examination after death and found extensive suppuration in the lungs, liver, and right kidney.

In a patient who died April 17, had been affected with a disease of the bones of the femur, and after that it was found in several months. In the hope of relieving the suppuration through the femur at the middle of the bone an operation was performed. There was profuse bleeding from a large number of small arteries and veins, which it was difficult to stop. For two days after the operation he vomited and was unable to eat. He died, however, from the operation, the suppuration being in the femur and afterwards.

In 1888, April 18, was admitted into Martha ward, on account of a tumor in the lower third of the left thigh. At the time of admission was the husband, Mr. H. Couling and Mr. J. A. Smith reported the case. She had always enjoyed good health until her suppuration began. She was about 40 years of age and lived in the city of the swelling. She had never felt pain there before but had the part been swollen. The swelling was swollen. When admitted a large tumor was found in the lower third of the left thigh, which was very painful, causing excruciating pain, and was the cause of her illness. Two months and a half after the operation of the tumor, which was soft cancer, I removed it through the middle of the femur. Her recovery was rapid and in two months the stump was healed, and she was able to leave the hospital when she was carried off to her home by a sudden attack of acute pneumonia.

In 1889, January 18, the mother of one child, was admitted in account of a tumor of the left thigh, which had been growing about six months. Mr. Gardiner was present at the time and the reporters Mr. Brooks and Mr. F. J. and others were at it. She was born amongst the poor in Lancashire, had been a domestic servant in London, and since her marriage had lived in Finsbury. The

complaint began with pain followed by swelling of the thigh just above the knee, in the third month of her first pregnancy. She fell down about three weeks since, and strained the part very much. The character of the growth could not be mistaken when first seen, and when she had been in Guy's about eight days, the femur broke as she was moving in bed. The pain was now more severe, and with the view to afford relief I amputated through the femur close to the *trochanter minor*. This patient progressed very favorably for two months; the stump was nearly healed, and her more severe sufferings had been considerably mitigated. After this she lost strength; her appetite failed, an abscess formed on the ilium and sacrum, and she died three months after the operation.

Dr. Wilks found after death carcinoma in the calvarium, fatty liver, and kidneys, and necrosis of the sacrum, and part of ilium.

23. A farm labourer, a man, aged 63, came into the Hospital with a very large ulcerated and bleeding growth of four or five years' development on the outer side of the left knee-joint. He was fat, looked tolerably healthy, but was bronchitic, and his hands were very unsteady. There were no well-marked indications of visceral disease. After being in the hospital a few hours profuse hæmorrhage occurred, and I amputated through the femur. There was not the usual amount of hæmorrhage, and the vessels requiring to be ligatured were few. He rallied well from the chloroform and operation, being, however, rather nauseated for a few hours. A little recurrent bleeding happened in the night, which ceased when the flaps were separated. The next day he was low, but spoke cheerfully and looked forward to recovery. On the third day after the operation he found much difficulty in breathing, and in coughing up the tenacious mucus which filled his bronchial tubes. He became very restless, distressed and low. In this state he continued for three days, and died on the sixth day after the operation.

Dr. Moxon found after death an inflammatory state of the lung coupled with new growths, which Mr. Howse examined. They were made up of fibro-plastic elements, and resembled the structure of the large tumour on the thigh.

Summary of the cases in which amputation through the Femur was performed in consequence of incurable disease, which was destroying the patient's health.

The total number of amputations is fifty-four; of these patients forty-four were cured; ten died.

The following brief notes may serve to show the causes of death:

Case.	Sex.	Age.	
14 ...	F. ...	32 ...	Disease of knee after puerperal phlebitis. P.M.—Disease of heart, liver, clots in veins.
15 ...	F. ...	22 ...	Disease of knee, exhaustion. P.M.—Fat liver.
16 ...	M. ...	19 ...	Old disease of knee, cachexia. P.M.—Bronchitis.
17 ...	M. ...	28 ...	Old disease of knee, exhaustion.
18 ...	M. ...	24 ...	Old disease of knee, secondary hæmorrhage. P.M.—Disease of lungs, old and recent.
19 ...	M. ...	48 ...	Old disease of left knee, cachexia, pulmonary disease. P.M.—Phthisis, acute suppuration in lungs, liver, and right knee-joint.
20 ...	M. ...	17 ...	Cancer of femur, cachexia, exhaustion.
21 ...	F. ...	18 ...	Cancer of femur 2½ months, pneumonia.
22 ...	F. ...	30 ...	Cancer of femur 18 months, exhaustion. P.M.—Cancer in calvarium, fat liver and kidneys.
23 ...	M. ...	63 ...	Fibro-plastic growth in thigh 4 or 5 years, bronchitis. P.M.—Pulmonary disease, like growth in thigh.

Thus, there were six patients affected with disease of the knee-joint; four of long standing. Five are shown by post-mortem examination to have been affected with more or less chronic disease of vital organs. Four others were primarily affected with a disease the influence of which on the constitution is well known.

On the forty-four cured patients the amputation was performed for the following diseases:

For disease of the knee-joint: on twenty-six individuals, eighteen males, eight females, at ages varying between five years and sixty in the following proportions.

Under 10 years.....	4
Between 10 and 20 years.....	10
" 20 and 30 ".....	5
" 30 and 40 ".....	2
" 40 and 50 ".....	4
At 60 years	1

On three individuals for cancer: one of the fibula, a female, aged 7; one of the tibia, a female, aged 31; one of the femur, a female, aged 33.

On three for fibro-plastic growths in the leg: a female, aged 42; a female, aged 20; a male, aged 35. One in the thigh, a female, aged 20.

One, a bony growth of femur: a male, aged 21. Growth on tibia, male, aged 66. Fibro-plastic growth on tibia, a female, aged 25.

Three for necrosis of tibia: a male, aged 15; a male, aged 27; a female, aged 34, also with disease of knee-joint.

Two for caries of femur: a female, aged 12; a female aged 32.

One for caries of tibia: a male, aged 27.

One for sloughing leg: a male, aged 48.

One for elephantiasis: a female, aged 52.

B.—Amputation through the Tibia and Fibula.

Total, 43 cases; cured 27; died 16. The amputations in the sixteen fatal cases were performed on account of injuries and diseases in the following proportions:—For injuries 12; for diseases 4.

I.—Amputations on account of Injury.

Of the twelve amputations on account of irreparable injury of the foot or lower region of the leg six were primary operations, six were secondary.

Three of the sufferers who underwent primary amputation may be said to have been "killed" by the effects of the injury.

1. A child five years old, whose lower limbs were crushed by the passage of a cart wheel over them. One leg was amputated, but the child survived the injury only a few hours.

2. A man forty years old fell from the roof of an omnibus. He was admitted with a compound comminuted fracture of the left tibia and fibula, and having lost much blood. Amputation was performed three hours after the infliction of the injury, which he survived about eighteen hours.

Dr. Wilks reports the result of his examination after death (1862, No. 49) to be as follows;

Kidneys affected with Bright's disease in an advanced stage. Organs generally contained much fat. Indications of a gouty diathesis. Body of an unhealthy man.

3. A railway labourer fifty-five years old, whose case is reported by Mr. Thomas Blason, was admitted with compound comminuted fracture of the right leg and compound of the left. He was likewise contused about the loins and thighs. He lost a considerable quantity of blood. The right leg was amputated. He rallied fairly, and there seemed to be some hope of his recovery when, during the morning of the fourth day after the injury and after a restless night, he somewhat suddenly expired.

The following patients survived the injuries and the operation for longer periods; varying between eight days and seventy-four.

4. A man, aged 55, reported to indulge in most dissolute habits, fell down stairs, being tipsy at the time. The left ankle-joint was dislocated, the bones fractured, and their ends protruded through a large wound of the integuments. He would not consent to amputation until twenty-four hours had elapsed. All the divided arteries were like bony tubes. Hæmorrhage was, however, arrested and never recurred. He was very low and prostrated, and in twelve hours the stump sloughed. Delirium tremens next appeared, and he died on the eighth day from the injury. There was no post-mortem examination, but doubtless all the tissues and organs had undergone fatty degeneration.

5. A London labourer, aged 36, was admitted on account of a compound comminuted fracture of left tibia and fibula, and a long wound on the upper and outer region of the left thigh. The patient was carefully attended by Mr. William Burton, the dresser, and the case is fully reported by Mr. G. H. Dyer. The soft parts about the bones of the leg were much lacerated, and the ankle-joint was opened. These injuries were produced by the fly-wheel of a steam engine a short time before his admission into Guy's. He lost a considerable quantity of blood during his transit to the hospital. He stated that his general health was not good, and that he was not intemperate in strong drinks. His condition as to nutrition was very characteristic of the London labourer, whose toil is severe and nutriment scanty and indifferent. He was old looking and

meagre. Primary amputation was performed below the knee, although the skin of the posterior flap was slightly contused.

He passed a good night after the operation, and for a day or two he did not suffer so much pain as usual after an amputation.

The fifth day after, he had rigors; and the flaps of the stump began to slough as well as the wound of the thigh, accompanied with constitutional excitement.

On the eighth day erysipelas appeared around both the stump and thigh; he fell into a typhoid state, and died on the twenty-third day after the injury.

Dr. Wilks, who made a post-mortem examination, found inflammation of the pleuræ and lungs, and inflammation of the mucous membrane of the ileum and colon (Necropsies, 1855, No. 41). Body very wasted.

6. A full report of the following case was made by Mr. C. Jordison. A woman, aged 26, was very drunk, in which condition she had been for four days, eating nothing, when she fell under the wheels of a heavily laden cart. This crushing weight produced compound comminuted fracture of the right tibia and fibula, and destruction of the soft parts around, as well as compound fracture of the right femur, the wound being near the hip. Three fingers of the left hand and one on the right were crushed. The entire left side of her body was severely contused, and a large piece of skin was torn off the left arm. She lost much blood.

She was brought into the hospital from a distance of about three miles, and soon afterwards the right leg was amputated below the knee. The fingers also were removed. She rallied fairly from the effects of the injury, stimuli being given liberally. The stump suppurated profusely, and her powers of repair seemed to be reduced to the lowest ebb. The stumps of the fingers healed slowly, but the contused integuments sloughed in several places. At one time those of the left leg seemed disposed to do so everywhere. However, after much attention and care the stump was healing, and the compound fracture was going on well, when she fell into a state of great irritability; she vomited continually, and at last died on the seventy-fourth day after the injury, thus surviving its effects ten weeks.

Dr. Wilks did not find any acute lesions of the viscera ~~on~~ the examination of the body after death. But the heart's tissue was atrophied, the liver loaded with fat, and floated in water (Necropsies, 1864, No. 274).

In the following series the amputations through the tibia and fibula were all secondary.

7. A house-painter, aged 48, cachectic, and of unsound health, fell from a height to the ground. The case is well reported by Mr. Robert Hicks and Mr. D'O. Brooks. He was admitted with compound fracture of the right tibia and fibula in their lower third, fracture of two or three ribs, and several contusions of the trunk. An attempt was made to save the foot, the soft parts about the fracture being not much injured. The hurt of the thorax caused him great suffering, but after suitable treatment these troubles subsided. The fracture progressed satisfactorily until about six weeks from the accident, when he lost his appetite, vomited, his pulse became rapid and feeble, and he low and desponding. Scarcely any repair of the broken bones having taken place at the end of three months, I amputated below the knee. He bore the operation very well, and for two days afterwards seemed likely to rally. On the morning of the third day secondary hæmorrhage took place; the stump was opened, but no open vessel was found. Bleeding occurred the next day, which exhausted him still more, and he died thirteen weeks after the injury.

An examination of the viscera was made by Dr. Wilks (Necropsies, 1855, No. 125). Lungs collapsed; no adhesions; the lungs and their tubes healthy.

Heart.—Left ventricle slightly hypertrophied. Firm white fibrinous clot in right side, as well as some in the left, but in less quantity. Aortic valves thickened. Two of them were adherent by their free surface as far as the corpora arantii. Mitral valve healthy. The front of the heart was covered by a considerable layer of fat. This encroached upon the muscular walls, which were much thinner in consequence, and whose fibres were undergoing fatty degeneration. The same was observable on many parts of the interior of both right and left ventricle.

Liver extremely fatty.

Kidneys.—Their weight 7 ozs. In an advanced stage of

Granular degeneration: cortical structure exceedingly small in amount and irregular in outline. Small cysts on surface, and, under microscope, general cystic degeneration. Tubes contained much granular and fatty matter.

8. Case of a labourer, aged 40, reported by Mr. F. M. Cann. He had compound fracture of his left leg produced by a piece of iron falling across it. Attempts were made to save it, but it sloughed; from the tenth day after the injury amputation below the knee was performed, which he survived to the sixth day. Dr. Wilks found after death that the femoral vein for two inches contained a softening, suppurating clot. There was a firm clot in right side of heart. Viscera generally healthy (Necropsies, 1858, No. 195).

9. A boy, aged 16, following the calling of a sailor, was brought to the hospital on account of a compound comminuted fracture of the left tibia and fibula. The case, fully reported by Mr. G. H. Atwell, is briefly as follows:—He had enjoyed good health and appeared of a sound constitution, although strumous and not very strong. The injury had been inflicted by the passage of a cart wheel over the limb. Amputation through the tibia and fibula was performed on the seventeenth day from the injury, the foot being gangrenous. He survived the operation to the seventh day, and the injury to the twenty-fourth.

Dr. Wilks reports as follows (Necropsies, 1858, No. 236):—Body spare. No yellow hue on its surface. Stump sloughing. The veins of it carefully examined and appeared quite healthy. Pleuræ, lungs, heart healthy.

Slight recent peritonitis at the lower part of the abdomen, proceeding from an abscess in the loin at the left side, just about to burst through the peritoneum.

Liver weighed $3\frac{1}{2}$ lbs. It contained several abscesses throughout, ready to burst at the slightest touch.

Spleen weighed $4\frac{1}{2}$ ozs. Numerous abscesses in it.

Kidneys weighed $12\frac{1}{2}$ ozs. Their structure was healthy.

The abscess in the abdominal walls which produced the peritonitis was found to proceed downwards into the pelvis as well as into the loins. It involved all the pelvic cellular tissue on the left side, where it formed a distinct abscess around the rectum. On removing all the soft parts, the ilium was found

to be uncovered by periosteum, and the left sacro-iliac joint was opened and its cartilage destroyed.

Probably an injury was inflicted on this joint at the time of the accident, and consequent abscess occurred, rather than disease of the joint from secondary abscess. Dr. Wilks remarks that from the lungs being healthy, and the liver and spleen only containing purulent deposits, it is probable that the pyæmia was only portal, and had its origin in the pelvic abscess.

10. A man, aged 70, was brought into the hospital on account of a compound fracture of the tibia and fibula. Thinking the limb might be saved, it was treated on the usual principles. For more than a week the progress of the case was satisfactory, then it became quite the contrary, and on the fourteenth day after the operation I amputated through the tibia and fibula. No material improvement took place, and he died seven days after the operation and twenty-one after the receipt of the injury.

The after-death examination, reported by Dr. Wilks (Necropsies, 1865, No. 106), showed pleuro-pneumonia, together with a diseased state of the liver and kidneys.

11. A man, aged 39, fell from a height of about thirty feet to the ground. He was a house painter by trade; was a very unhealthy-looking man; had suffered from sunstroke four years since, and had been addicted to indulgence in stimuli. These notes are taken from a full report of the case by Mr. George W. Shipman. He was admitted into Guy's with compound comminuted fracture of the right tibia and fibula. An attempt was made to save the foot, but extensive suppuration taking place about the injury, secondary amputation below the knee was performed on the fifteenth day after the accident. For a few days after the operation he was violently purged, and became much reduced. Very little action took place in the stump. He took scarcely any food, he passed sleepless nights, on the thirty-sixth day after the injury he had rigors, and on the forty-seventh he died.

Dr. Moxon found (Nec. 1866, No. 217) after death pleuro-pneumonia, fatty degeneration of the muscular tissue of the heart, and unhealthy kidneys.

12. A very unhealthy-looking man, aged 28, was admitted with a compound comminuted fracture of the tibia and fibula,

and several contusions. He was hurt by becoming entangled in a lift, and was crushed between it and the wall. He had been existing upon a very small amount of food for the last few weeks, being out of work. After attempting to save the injured part, and all hope of doing so being lost, I amputated through the tibia and fibula, close below the knee, nine days after the infliction of the injury. He recovered fairly from the operation, and until the fourth day afterwards, when slight secondary bleeding happened, owing probably to a sloughing state of the stump, which appeared when the flaps were separated. In a few days the surface of the stump became healthy, and his general condition had improved. Then he was attacked with pleurisy and pneumonia, in spite of which, however, the stump was slowly healing. For the next month he was very low, and his face remarkably palid; a distressing cough and profuse purulent expectoration caused prostration, and he died about nine weeks after the accident.

Dr. Moxon's report of the after-death examination is as follows (*Necropsies* 1869, No. 55):—On opening the chest there was no discharge of gas. Both lungs quite filled the thoracic cavity. The left, however, was only free in front. In breaking down the adhesions at the side which were tough part of the lungs was torn. There was then a sudden rush of gas, the lung collapsing at the same time. The left lung was healthy anteriorly, save that the air-cells were emphysematous. The visceral surface of the pleura in the same position was quite smooth and shining. No trace of any inflammation. Posteriorly, there were old adhesions, and the lung tissue was torn. Quite behind, the lung tissue was indurated and covered with an old layer of lymph, rather thick in parts. There were about twelve ounces of fluid on this side of the thorax which must have been contained in a cavity, posteriorly circumscribed by the above described adhesions. On cutting into the lung, five or six abscesses came into view, each circumscribed by a thick tough wall, as if in process of healing, and containing thick curdy pus. The lung bordering on all the abscesses was condensed, and exhibited scarcely any trace of air-cells. Right lung emphysematous, especially anteriorly. Eight ounces of fluid in the pleura. Other viscera normal.

—*Amputations through the Femur and Fibula on account of Disease.*

There were four — one for injury; one for disease of the bone; one for epithelioma of the tibia; one for a fibro-plastic growth in the leg.

12. A woman, aged 32, delicate, imperfectly nourished, suffered necrosis from a surgical injury of the leg, and a wasting of the muscles. Being a useless member below the knee she was desirous it should be removed. Amputation through the tibia and fibula was performed, and she died on the twentieth day afterwards from pneumonia.

After death, abscesses were found in both lungs and in the liver. *Narratives*, 1863, No. 122.

13. A man, aged 45, cachectic, never well nourished, was admitted in a state of extreme constitutional debility with aneurysm. The integuments on the outside of the leg had been sloughing; the metatarsal bones of the foot were necrosed, the member itself being affected with suppurative ulcers. *Ibid.*, 1867. There had been more or less inflammation and suppuration of the parts for four years. The necrosed parts were removed, after means had been successfully employed to improve his health. He progressed very slowly for several days, but little union of the flaps took place. He then suffered from a stoma over the sacrum, from which ultimately he slowly declined and died on the thirtieth day after the operation. The stoma was nearly healed.

14. *Wills' Reports*, *Narratives*, 1868, No. 36 states that he found pyomyositis and purulent abscess at the base of the left lung; that the kidneys were large, weighing ten and a half pounds; and that the liver was extremely full of fat, and weighed three pounds seven ounces. A cured lumbar spina bifida was also found. *Ibid.*, 1874.

15. A plasterer, aged 41, of intemperate habits, cachectic aspect, extensive aneurysm, fell from a height to the ground, and cut both legs about twelve years before; he was admitted under my care. This case was fully reported by Messrs. W. F. Johnson, G. W. Dennis, and C. E. Mariel. For several years the right leg had been ulcerated, and when first admitted it appeared like epithelioma. For six months every attempt was

made to cure this disease, but without success. He left the hospital for about one month and then returned, anxious to have the limb removed. Amputation was performed below the knee, and although he seemed to be doing well for some days, he at last died on the twenty-eighth day from the operation.

Dr. Wilks reports (Necropsies, 1855, No. 141) that he found general adhesions between the lungs and the parietal pleuræ on both sides. Bronchi acutely inflamed. Lower lobes of both lungs inflamed. Advanced cirrhosis of the liver, biliary congestion and very fatty. Kidneys large, congested, and granular.

16. A Lambeth labourer, aged 50, was admitted with a tumour in the calf of the right leg. These brief notes are from reports of the case by Messrs. Robert J. Rogers, Edward Lynes, and George Owen. Five years before he was in Guy's under Dr. Hughes for renal dropsy. Twelve months ago he scalded his right foot with boiling pitch, but recovered in three or four months. He is spare, thin, delicate, and admits to being "something of a drinker." The tumour in the right leg had been growing about a year. Dr. Wilks reported that the right side of the chest was dull with crepitation and deficient respiration. The urine was free from albumen. He remained under treatment in the hospital for about five months, during which time the condition of his lungs improved as well as his general health. He then was discharged, in the hope that change of air would be beneficial. After about two months he returned improved in health, and amputation was performed through the tibia and fibula just below the knee. He was very much reduced by vomiting after the operation; absorbent inflammation affected the limb, and after rigors he died on the eleventh day from it.

Dr. Wilks reported the result of his examination to be gangrene of the right lung; a soft and flabby heart; a liver with excess of fat in it, and easily torn; and kidneys weighing thirteen and a half ounces, of coarse texture, and also soft.

(Necropsies, 1857, No. 185.)

Drawing of Tumour, 198⁷⁰.

Prep. of it, 1376⁶⁵.

Summary of the cases of amputation through the Tibia and Fibula on account of injuries or diseases of those bones, or of the foot.

Total number of cases 43 ; of these, 27 patients were cured, 16 died.

Of the "traumatic" amputations, 28 operations, 16 patients recovered, 12 died.

Of those who died, primary amputation was performed in 6 instances, secondary in 6.

Three patients submitted to primary amputation were "killed" by the injury.

Of the remaining three—

- | Case. | Sex. | Age. | |
|--------|--------|---------|--|
| 4. ... | M. ... | 55. ... | A drunkard. Delirium tremens ; fatty degeneration. |
| 5. ... | M. ... | 36. ... | Comp. fract. leg ; large wound of thigh. P. M.—Inflammation of pleura and lungs, ileum and colon. |
| 6. ... | F. ... | 26. ... | A drunkard, otherwise severely injured. P. M.—Not very generally diseased ; excessively fat liver. |

The fatal cases after secondary amputation—

- | | | | |
|---------|--------|---------|--|
| 7. ... | M. ... | 48. ... | Most unsound. P. M.—Fatty degeneration. |
| 8. ... | M. ... | 40. ... | Sloughing limb. P. M.—Clot in artery ; organs healthy. |
| 9. ... | M. ... | 16. ... | Foot gangrenous. P.M.—Large abscess about sacrum and ilium. |
| 10. ... | M. ... | 70. ... | Sloughing leg. P.M.—Pleuropneumonia ; disease of liver and kidneys. |
| 11. ... | M. ... | 39. ... | Unhealthy, sloughing leg. P.M.—Pleuropneumonia ; diseased heart and kidneys. |
| 12. ... | M. ... | 28. ... | Very unhealthy ; severely contused, sloughing leg. P.M.—Empyema. |

The state of the hurt member at the time of the operation was due to the combined effects of the injury and the generally diseased state of the viscera and tissues, causing the patients to be in the most unfavorable condition when submitted to operation.

Of the "traumatic" amputations which were cured there were 16 cases, 15 males and 1 female. The ages of the individuals varied between 7 years and 47.

Under 10 years	...	1
Between 10 and 20 years		4
" 20 "	30 "	2
" 30 "	40 "	2
" 40 "	50 "	7

The primary amputations were 12, the secondary 4.

Amputations on account of disease were performed on fifteen patients. Of these eleven were cured; four died. Of the cured seven were males, four females. Their respective ages varied between three years and sixty.

Under 10 years.....	2
From 10 to 20 years.....	2
" 20 to 30 "	1
" 30 to 40 "	1
" 40 to 50 "	2
" 50 to 60 "	3

The following circumstances gave rise to the necessity for the operation :

Deformity	2 cases.
Disease of foot	3 "
" of ankle-joint	2 "
New growths	3 "
Necrosis of tibia.....	1 "

The fatal cases were four; three males, one female. Their respective ages were 40, 45, 50, and 22.

Case.	Sex.	Age.	
13 ...	F. ...	22 ...	Deformed leg, not well nourished. P.M.—Abscesses in lungs and liver.
14 ...	M. ...	45 ...	Cachectic, deformity of foot, long diseased. P.M.—Fatty degeneration.
15 ...	M. ...	40 ...	Epithelioma of leg, intemperate, dissipated. P.M.—Disease of liver and kidneys.
16 ...	M. ...	50 ...	Growth in leg, damaged health. P.M.—Gangrene of lung, disease of liver, heart, and kidneys.

DIVISION II.—OPERATIONS ON THE UPPER EXTREMITY.

A.—Amputations through the Humerus.

Twenty-six amputations were performed at various parts of the humerus. Fourteen were cured; twelve died.

The operation was performed on twenty-three patients on account of injuries, on three for diseases.

	Total.		Cured.		Died.
For Injury	23	...	12	...	11
For Disease.....	3	...	2	...	1

I.—Amputations after Injuries to the bones and soft parts of the forearm or hand.

Two patients were killed by the injuries inflicted, that is to say, they never rallied entirely from their effects.

1. A male, aged 60, suffered amputation through the upper part of the humerus on account of compound comminuted fracture of that bone, and of the radius and ulna. The injured parts were removed within two hours from the accident, but the man never rallied, and died in four days.

2. A woman, aged 68, was knocked down in the streets, and sustained the following injuries. Compound comminuted fracture of right humerus, fracture of right clavicle and nearly all the ribs on the same side, scalp wounds and wounds on face and neck. The injured arm was amputated, and she survived the injury to the second day.

Primary amputation was performed on the four following patients :—

3. A Southwark carman, aged 52, was injured by being crushed between a cart and a wall, the cart being dragged by a horse at full speed. Mr. Whitefield has fully reported this case. He states that the man had enjoyed good health, but he was large, fat, and flabby. The injury was compound comminuted fracture of the right humerus at its upper third, with an extensive wound of the integuments and fascia of the axilla exposing the vessels and nerves.

He lost much blood. Amputation was performed close up to the shoulder-joint, through the neck of the humerus. He rallied fairly after the operation ; and on the fifth day from it the surface of the flaps began to slough. Five days after this their surface was clean. The next day he was delirious, and in struggling to rise from his bed secondary hæmorrhage took place. The bleeding was soon stopped by pressure, as it was not possible to find the end of the vessel from which the blood flowed.

The next day he lost more blood, and, becoming rapidly exhausted, he died on the twelfth day after the infliction of the injury.

After death (Necropsies, 1855, No. 195) Dr. Wilks found sloughing arteries of the stump, and a morbid deposit of fat in the liver, but the rest of the viscera were healthy.

4. A man, aged 20, had his left arm caught in the strap of a grindstone, which took off a part of the forearm and lacerated the soft parts around the elbow.

Mr. Benj. Duke, who reported the case very fully, states that a good deal of blood was lost before he came to the hospital. I amputated through the middle third of the humerus. He passed a restless night after the operation, and on the second day after he had diarrhœa. The stump was suppurating. This disposition to relaxed bowels continued in spite of medicine, and he never was free from great constitutional excitement. On the sixth day from the injury he died.

Dr. Wilks found the brain healthy. There was slight separation of the periosteum from the outer side of the occipital bone; but no fracture of the skull.

The lungs were ecchymosed, but no lobular pneumonia.

Viscera generally healthy, although softer than usual.

Suppuration of stump extending upwards between the muscles (Necropsies, 1865, No. 47).

5. A boy aged 14 had his arm crushed by machinery, which necessitated its removal above the elbow. For twenty-five days he progressed satisfactorily, then fell into a typhoid state, and died on the thirtieth day after the injury.

Dr. Moxon found after death inflamed patches on pleuræ over the surfaces of the lungs, corresponding with lobules affected with inflammation. Both lungs contained many small abscesses. There were several large abscesses in the liver; one in the spleen. The other viscera were healthy (Necropsies, 1865, No. 296).

6. A railway labourer, aged 28, was knocked down by some trucks, the wheels of which produced lacerated wounds of both thighs. and compound comminuted fracture of the radius and ulna. He lost much blood, and although a fine powerful stout man he appeared to be greatly prostrated by the injury. Amputation through the humerus was per-

In the five cases next following, secondary through the humerus was performed on account of

7. A dock labourer, aged 51, resident in Whitechapel and muscular, crushed his right forearm between wheels of a crane. The case is fully reported by J. E. Jones and Astley Cooper. An attempt was made to save the member, and for a day or two the case was satisfactory, although considerable constitutional excitement was excited. Acute local inflammation followed by suppuration was set up, and on the twenty-eighth day from the injury it was deemed expedient to amputate through the humerus. After a day or two the stump sloughed, indicating pneumonia became well marked, and after rigors, and prostration, he died thirty-eight days after the receipt of the injury. No post-mortem examination.

8. A boy, aged 8, was admitted on account of laceration of the integuments of the right forearm by the passage of a wagon wheel over the member. The forearm sloughed, as well as some of the contused muscles, and on the eighth day from the injury I removed the forearm through the humerus. On the second day after the operation symptoms of tetanus appeared, which increased rapidly, and in a tetanic spasm the boy died on the

spasms supervened, and the following day amputation through the humerus was performed. He survived the operation to the third day, and the injury to the twenty-first.

Examination after death showed the viscera healthy, the bronchial tubes filled with mucus.

10. A boy, aged 13, was admitted with compound fracture of the left humerus. It was caused by the passage of a brewer's dray over the arm. He was most cachectic, wretched-looking and puny. Secondary amputation was performed on the ninth day after the injury. This he survived to the fourteenth day, and the injury to the twenty-third. (Necropsies, 1867, No. 26.) Dr. Moxon found an abscess in the medullary canal of the cut humerus. A small abscess in the right hemisphere of the brain. Left pleura coated all over with lymph. Numerous abscesses in right lung. At lower end of left kidney incipient suppuration in cortex.

11. An unhealthy man, aged 40, was admitted with inflammation and suppuration of the hand and arm, consequent on a punctured wound of a finger. The integuments and fascia of the forearm sloughed away, and the member being further disorganized by this process, amputation through the humerus was performed. He survived the injury to the twentieth day, and the operation to the third.

II.—Amputations on account of Disease.

Only one patient died after amputation through the humerus on account of disease. This case affords an illustration of the manner in which the proposals of the surgeons are often thwarted by the parents or friends of patients under their care; for the death of the boy is, doubtless, to be assigned to the delay of performing amputation, until there was scarcely a chance left for its successful issue.

12. A most cachectic, strumous, and half-starved Irish boy, aged 14, had suffered with disease of the elbow-joint many months. I excised the olecranon ulnæ, and for some weeks there seemed some chance of saving the hand. Profuse suppuration, attended with constitutional disturbance, supervened, and I wished to amputate through the humerus, when the

parents of the boy were sufficient to encourage a hope of success. The parents, however, indignantly refused assent, until their child was within a few hours of death. Then it was done and the child duly survived to the next day. Death was caused in his instance by simple exhaustion.

Summary of the Cases of Enucleation through the Humerus on account of Injuries and Diseases of the Bone itself, or of those of the Joints and the Soft Parts around them.

Total number of cases 34. Of these 14 patients were cured, 20 died.

Of the traumatic amputations, 33 operations, 12 patients recovered, 21 died.

In these cases both primary amputation was performed in 7 instances, secondary in five.

Two patients submitted to primary amputation were "killed" by the injury. Of the remaining four—

- | | | | |
|------|-----|-----|--|
| Case | No. | Age | Large gunshot in compound fracture humerus, large wound in a chest and skull, section close to shoulder joint, secondary hemorrhage. P.M.—Sweeping arteries of stump, lost life. |
| " | " | " | Enucleation before mortuum. Died after. P.M.—Suppuration extending along arm. |
| " | " | " | Arm cut off by machinery; pneumothorax, abscess in lung, liver and spleen. |
| " | " | " | Wound in back, right chested fracture, railway injury. P.M.—Dying very marked. |

The four cases after secondary amputation:—

- | | | | |
|------|-----|-----|---|
| Case | No. | Age | Crushed humerus, inflammation, pneumothorax. |
| " | " | " | Sweeping arm after extensive necrosis. |
| " | " | " | Enucleation of arm, necrosis. |
| " | " | " | Carbuncle. P.M.—Abscess in brain, lung, kidney. |
| " | " | " | Sweeping arm and hand, extensive. |

Of the "traumatic" amputations which were cured, there were 12 cases all males: the ages of the individuals varied between 15 and 61.

10 to 20 years.....	2 cases.
20 to 30 „	3 „
40 to 50 „	2 „
50 to 60 „	4 „
60	1 „
	<hr/>
	12

The primary amputations were 7; the secondary 5.

Amputations through the humerus for disease were performed on 3 patients; 2 were cured, 1 died. Of those cured one was a male, aged 35; the other a female, aged 27. The male suffered with sloughing of the arm, the female with osteoid cancer of the forearm.

B.—Amputations through the Ulna and Radius.

After 25 operations through the ulna and radius; 23 patients recovered, 2 died.

The operation was performed in 14 cases on account of injuries, and in 11 for disease, and the mortality was as follows:

	Total.	Cured.	Died.
For injury.....	14	13	1
For disease	11	10	1

I.—Amputation on account of Injury.

1.—A Southwark labourer thirty-five years old had his carpal-joint and end of the radius crushed by the passage of a cart wheel over it. He stated he enjoyed good health, and was of temperate habits. Primary amputation through the ulna and radius was performed. He progressed very favorably until the thirteenth day after the infliction of the injury, when rigors, pain in the right hypochondrium, and great constitutional disturbance supervened. He survived the receipt of the injury to the twenty-sixth day.

Dr. Wilks found pleuropneumonia, and abscesses in the lungs and liver. (Necropsies, 1854, No. 185.)

II.—Amputation on account of Disease.

2.—A peasant seventy-nine years old had been troubled with cancer over the whole of the back of the left hand for

serious morbid. He had been suffering great pain in the affected region. Amputation was performed through the ulna and radius, which he survived to the fifth day. He sank from exhaustion. These notes are from a report of the case by Mr. Wm. Smith. There was no post-mortem examination.

Summary of the amputations through the Ulna and Radius in relation to injuries and diseases of those bones, or of the nerves and the soft parts around them.

Total number of cases twenty-five. Twenty-three patients recovered, two died.

Of the "traumatic" amputations, fourteen operations, thirteen were cured, one died.

On the patient who died, a male æt. 35, primary amputation was performed. After death pleuropneumonia and abscesses in lungs and liver were found.

On the thirteen patients cured primary amputation was performed in twelve instances, secondary in one. All were of the male sex. Their ages varied between eleven years and thirty-nine.

From 11 to 20 years	7 cases.
" 20 to 30 "	4 "
" 30 to 41 "	2 "

Amputations through the ulna and radius for disease, eleven cases, ten recovered, one died. Of those cured six were males, four females. Their ages varied between one year and a half and sixty years.

Under 11 years	1
From 11 to 20 years	2
" 20 to 30 "	1
" 30 to 40 "	3
" 40 to 50 "	2
" 50 "	1
	<hr/> 10

The diseases were as follows:

Disease of the carpus	6 cases.
Osteomyelitis of hand	1 "
Cancer of hand	3 "

General summary.

One hundred and seventy-one persons underwent amputations of portions of their extremities.

In this number the mortality was as follows:—

Patients cured	115
„ died.....	56
	<hr/>
	171

This shows a mortality of about one third, or 32·74 per centum.

Four persons submitted to double operations.

Cured	1
Died	3
	<hr/>
	4

Of the 3 deaths 2 were produced by the immediate effects of the injury. One patient survived to the tenth day and died suddenly.

Upon one hundred and sixty-seven individuals single operations were performed.

Patients cured	114
„ died.....	53
	<hr/>
	167

or 31·73 per centum.

Of the fifty-three fatal cases after single operations, 10 of the sufferers were killed by the immediate effects of the injury.

In twenty-two it was demonstrated after death that chronic visceral disease existed at the time of the infliction of the injury.

In fifteen the general condition of the tissues, the diathesis of the patient or other circumstances, were indicative of impaired powers of nutrition.

Two died of tetanus.

One died from shock of operation.

In three the tissues were healthy.

The mortality after amputation through the femur was as follows :

For INJURY, the total number of cases was 13; of these 8 were *primary* operations.

Five persons were killed by the immediate effects of the injury.

Of the remaining 3, after death examination showed in 1 disease of the kidneys, the immediate cause of death being pneumonia and inflammation of the veins of the stump. In the others, both of them with broken-down health, their general appearance indicated a fatty degeneration of the organs and tissues generally. Both died after symptoms of acute inflammatory disease.

The *secondary* operations were 5.

In 2, after death examination showed chronic disease of the viscera. In 3, although there was none, the general appearance of the patients indicated broken-down constitutions.

For DISEASE, the total number of cases was ten.

In 6 persons, after death, examination showed the existence of diseased viscera at the time of the operation; 1 died from the shock of the operation. In 4 cases, no such examination being made, all, probably, had diseased viscera, except 1, and she died of acute pneumonia.

The mortality after amputation through the tibia and fibula was as follows:—

For INJURY, the total number of cases was twelve; of these six were *primary* operations.

Three persons were killed by the immediate effects of the injury; 1 of these had chronic disease of the viscera, as seen after death.

On 2, after death, examination showed chronic disease of the tissues; one, not examined, was aged, and probably all the tissues and organs were diseased.

The *secondary* operations were 6. All the bodies were examined after death.

Four showed indications of chronic disease of the viscera; 1 was very strumous and unhealthy during life; in 1 the viscera were healthy.

For DISEASE the number of cases was 4. All the bodies were examined after death, and chronic disease of the viscera was found in 3 of them. In 1 no chronic visceral disease was seen, but the patient was deformed and unhealthy.

The mortality after amputation through the humerus was as follows :—

For INJURY, the number of cases was 11 ; of these 6 were *primary* operations.

Two of the hurt persons were killed by the immediate effects of the injury ; both were sixty years old. The rest, examined after death, showed chronic disease of the viscera in two instances, but none in two others.

The *secondary* operations were 5.

Two died in consequence of tetanus ; 1 was a very unhealthy boy ; and the remaining 2, although not examined after death, showed all the indications of diseased tissues.

For DISEASE, one operation was performed on a dying strumous child, the parents refusing their consent to its performance until little hope remained of a successful issue.

The mortality after amputation through the ulna and radius was—

For INJURY, 1. It was a primary operation, and an examination showed chronic disease of the viscera.

For DISEASE, 1. A man, aged 79, who had long endured acute sufferings, and sank from the shock of the operation chiefly.

From the above evidence we may conclude that a large proportion of the patients submitted to amputation, when inmates of a metropolitan hospital, are the subjects of more or less advanced chronic disease of the thoracic or abdominal viscera. It is true that the immediate cause of death may be an acute inflammatory attack of a vital organ to which it is reasonable to suppose diseased persons may be more prone than healthy ones ; but the facts show, at the same time, that “the chances of death after operations appear to depend almost entirely upon the previous state of each patient’s constitution,” as stated by Dr. Chevers.

NUMERICAL ANALYSIS

OF THE

PATIENTS TREATED IN GUY'S HOSPITAL

FROM 1861 TO 1868.

By J. C. STEELE, M.D.

A similar analysis to that proposed to be given in the following pages appeared in the Journal of the 'Statistical Society' for September, 1861, and embraced the septennial period terminating 31st December, 1860. For purposes of statistical comparison and reference a similar plan to that adopted in the previous abstract will be followed in this, and the tables containing the chief numerical details will be associated together at the end of the report.

At the commencement of the period under review, and for some years previous to that time, the hospital accommodation consisted of 572 beds, of which 320 were reserved for surgical cases, 240 for medical, and 12, mainly placed in private rooms, were employed for special cases. The two chief departments of medicine and surgery were again subdivided into numerous special departments, comprising accident, clinical, ophthalmic, uterine and venereal diseases, altogether absorbing 195 beds, and reducing the number allotted to ordinary surgical purposes to 185, and to ordinary medical cases to 190. The only modification of this arrangement that has been since made consists in the alteration of one ward containing twenty-four beds, previously employed for medical cases, and which, since the summer of 1862, has been continuously occupied by surgical cases. This arrangement was made purposely to meet the anticipated requirements of the hospital at the time St. Thomas' Hospital was removed from the immediate neighbourhood, and the ward has since been made

largely available for the reception of accident and urgent cases. In the article referred to it was stated that in the course of the septennium from 1854 to 1861 the hospital had added to its accommodation fifty additional beds, and it will be observed in contrasting the numbers treated at one period with the other that this addition has exercised a very material influence on the general results. But the most marked features in the present returns consist in the increased numbers of accidents and operation cases, which, together with the admission of a considerably larger number of cases of urgent and hopeless disease, which could not well have been refused at any hospital, have contributed to augment the general mortality as well as to influence unfavorably the general results of treatment. With these preliminary observations I will now refer to the subjects of the various tables.

Table I contains a summary of all the patients treated during the period under consideration, specifying generally the results of treatment and the mortality. It takes note of 35,025 patients, of whom 17,154 were discharged well or convalescent, 10,679 were relieved partially or permanently, 2714 were unrelieved or worse at the period of their discharge, 769 were reported as unfit from some disqualifying circumstance to be retained in the hospital, while 3423 died, the total number being made up by the addition of 466 who remained in the hospital on 1st January, 1868. These numbers present an increase of 2392 cases over the corresponding numbers treated during the previous septennium, while the comparative results of treatment tend to indicate a graver character in the nature of the cases from the circumstances already referred to. Thus the number of cases entered as having been discharged well are considerably below the average of the former period, and the total number of deaths show an excess of 445 over the previous mortality, which was somewhat abnormally augmented by the occurrence of cholera during the year 1854, contributing seventy deaths to the mortality of that year. It is but reasonable to surmise that the results of treatment specified in the table are open to criticism, inasmuch as their accuracy might have been influenced by the habits and impressions of the numerous reporters; but this circumstance, provided it obtained, is not unattended with advantage, as it necessarily precluded any errors that might have arisen

from the individual bias of a single Registrar. The general results, therefore, may be received as a tolerably fair index of the measure of success attending treatment, and may safely bear comparison with similar returns from kindred institutions. Under the first subdivision, entered as "well," are comprised all cases restored to health either temporarily or permanently, or where convalescence has been so far established as to enable the patients to leave the hospital without detriment. The number so discharged amounted to 48 per cent. of the entire number admitted, showing a considerable diminution when compared with the preceding septennium, when the corresponding subdivision averaged 56 per cent. of the whole. The second heading in the list indicated by the term "relieved" comprises a smaller number of patients, although it embraces a wider range of results than the other, inasmuch as it necessarily has to be used equally for incurable as for curable maladies, and extends its area of result from the temporary relief of urgent symptoms to permanent amelioration of organic lesions, modified at the same time by continuance of constitutional disease. The number relieved averaged 30 per cent. of the total number, while in the former analysis it only amounted to 24 per cent., the difference being mainly accounted for by the larger number in the former instance being classified under the heading "well." The term "incurable" might have included many of the cases entered as relieved, but it is here chiefly meant to convey an entire absence of relief at the period of discharge. The number so discharged present a striking similarity in the two periods under review, amounting in each instance to betwixt 7 and 8 per cent. of the total. The mortality over all, which in the former period averaged 9·2 per cent., in the latter increased to 9·8.

Tables II and III distinguish the number of patients discharged for each year of the septennium, denoting also the sexes and the relative mortality in the medical and surgical cases. The relative proportion of medical to surgical cases admitted to the hospital is here shown to maintain a ratio of two of the former to three of the latter, while the sexes are accommodated throughout in a similar proportion, namely, two females to three males; but when they come to be subdivided into the two departmental divisions of medical and surgi-

cal, differences become more apparent. Thus the greater demand for surgical assistance by the male sex is shown by the fact that of the total number admitted to the surgical wards, sixty-four per cent. were males, while thirty-six were females; while on the medical side the numbers become more equalised, the proportion being fifty-three males to forty-seven females. The admissions from year to year differ very little in numerical amount, as, from no recommendations being required, and the continual demand for accommodation, there is no difficulty experienced in keeping the hospital fully occupied, and the trivial fluctuation in numbers noticed on comparing one year with another must be attributed to the temporary vacation of the wards for sanitary objects at stated intervals, rather than to any diminution or increase of disease in the neighbourhoods which are the chief sources of supply to the hospital. The general mortality also exhibits a slight fluctuation, the minimum being 9·3 per cent. in 1865, and the maximum 10·6 per cent. in the respective years 1866 and 1867. When we come to define the death rate in the medical as compared with the corresponding mortality in the surgical wards, we find a much greater variation existing from year to year. Among the medical cases, dealing with so many diseases of a hopelessly incurable character, the death rate has never fallen below 14 per cent. in the course of any year, which minimum of fatality it reached in 1861, nor has it risen higher than the maximum per-centage of 18, which it reached in 1866. Males, as might have been expected, suffer in a greater ratio than females, the average death rate among the former amounting to 18·5 per hundred, while the mortality among women is not more than 12·5, and in both sexes together it maintains an average throughout of 15·2 per cent. From the fact of ninety beds on the surgical side being reserved for syphilitic and ophthalmic cases, in which there is little or no mortality, as well as from the more favorable character of the diseases generally, the death rate among surgical patients has never averaged more than 6·4 per cent., the minimum rate being 5·6 in 1861, and the mean mortality 6 per hundred. The disparity in the death rate betwixt the sexes noticed in the medical department is not so apparent among the surgical cases, that of the men averaging 6·5, while the women do not suffer more than in the proportion of 4·9 per hundred. It may thus

be proved that of the males admitted to hospital, 1 dies in every 9.3 or 107 in every 1000, and that of the females 1 dies out of every 11.7 or 85 in every 1000. The rate of mortality in this as well as in every hospital is ruled by the nature of the diseases admitted to the wards, and by the proportion which the medical bear to the surgical cases. We have already seen that the numbers admitted are in the ratio of two of the former to three of the later, a proportion that will be found to be pretty general among the metropolitan hospitals, and which accounts for the pretty uniform death rate in these institutions. It can scarcely fail to be noticed that the mortality during the last two years of the series under review underwent an appreciable increase, less remarkable, however, in the surgical than in the medical department. In the year 1866 the number of deaths from chest and heart affections alone amounted to 202, and in 1867 to 217, or 42 per cent. of the whole mortality. No disease determines so much the general death rate as tubercular consumption, and notwithstanding the restrictions which act as a barrier to the indiscriminate admission of patients suffering from this disease, it is to be feared that it will always form the heaviest item in the bill of mortality. The principal objection to the ready reception of such cases arises from the lengthened period which they are likely to pass in the hospital. On this circumstance mainly rests the variation in the length of residence of the patients generally from year to year, and it accounts also in some degree for the variations which are noticed to exist in the annual mortality. An increased length of residence in the medical wards is invariably associated with a high rate of mortality, from the fact of the chronic maladies so retained issuing in fatal results, while in the surgical wards the converse is the case, from the more hopeful character of the cases that require a long and continuous treatment. The average residence of all the patients has amounted during the septennium to thirty-three days, the surgical preserving a mean of thirty-four, and the medical, one of thirty-two days.

Table IV, specifying the various classes of disease with the results of treatment, consists of an analysis of all the cases entered on the hospital register during the period, arranged under fifteen classes or subdivisions, the more minute registra-

tion of each individual malady having been already published in the annual statistical reports. The classification is partly anatomical and partly pathological, and for numerous purposes of reference it is, perhaps, as convenient and accurate as any other system of registration that could be adopted. The first five headings, as well as the twelfth and thirteenth, are strictly anatomical in their scope, and embrace diseases connected with the nervous, respiratory, circulatory, visceral, and genito-urinary organs, and of the eye and skin, while the remainder, exclusive of injuries, are of a more or less constitutional and miscellaneous character.

1. Diseases of the nervous system, including cranial and spinal concussion without any material external lesion, represent the first group of cases in the table. The number of entries registered under this head are represented by 75 in every 1000 cases treated in hospital, and the mortality arising from the same is estimated by the number 68 in every 1000 deaths. The relative mortality, or that which governs the diseases in the group, has averaged during the period 8.93 per hundred. Cases of hysteria, amounting to an average of forty-five annually, have a numerical majority, and close upon these and in order of succession come cases of chorea, epilepsy, and cerebral concussion, which together form about a third of the total number. After these, in numerical succession, are placed "paraplegia," "paralysis," and "hemiplegia," which, combined with the various forms of partial paralysis, embrace another third of the entire number. The remainder is made up by the more acute diseases of the brain and nerves, and the disorders of the intellect attributable mainly to hypochondriasis and alcoholism. Among the more exceptional diseases noted are five cases of sunstroke, three of catalepsy, and two of hydrophobia which both happened in the same year 1866.

2. Diseases of the respiratory organs are admitted in the proportion of 80 to every 1000 patients, while the deaths resulting from these maladies absorb 235 of every 1000, or nearly 25 per cent. of the deaths occurring in hospital. The relative mortality of the group amounts to 29 per hundred of the cases admitted. Tubercular consumption forms by far the heaviest entry in the group, both numerically and in point of fatality. During the period the average number of phthisical cases treated

[illegible][illegible]

During the year the relative incidence of the month of May is 1.5 in every 100 cases, and the mortality of this month is represented by 125 in every 1000 deaths. The relative mortality of the group amounted to 1000 per cent. With the exception of the cases of hernia, which come average fifty-three annually, and some affections of the month and some the remainder of the cases amounting to two thirds of the entire number are medical affections, properly so called. Next in order of frequency to hernia are cases of dyspepsia and affections of the rectum, which respectively con-

tribute about an equal number, averaging about thirty cases from each source annually. The most fluctuating entry in the group is diarrhœa, which in one year, 1866, when cholera was prevalent in some parts of the metropolis, reached its maximum of thirty-seven, while in the subsequent year, remarkable for a long continuance of dry, hot weather, it reached its minimum of four cases.

5. Diseases of the urinary and genital organs comprise with one exception a larger number of cases of disease than are to be found classified under the other headings. They are represented by 105 in every 1000 patients admitted, and contribute 83 to every 1000 deaths. With the exception of the uterine affections the diseases in this group are almost entirely of a surgical nature, and the relative mortality is accordingly small in comparison with the four subdivisions already noticed, not amounting to more than 7·76 per cent. By far the most numerous entries in the group refer to cases of stricture and extravasation, which present an annual average of 105 cases, with an annual average mortality of six. Next in frequency are diseases of the bladder, hydrocele, and vesical calculus, which average respectively about thirty cases each year. With respect to vesical calculus it may be explained that the discrepancies betwixt the disease-list and the operation-list with reference to the numbers admitted and the numbers operated on arise from a considerable number of patients being admitted annually with symptoms of the disease, who in reality have no stone in the bladder at all, but who are registered as having been supposed to have suffered from stone. A smaller number, again, after having been discharged without operation, have returned to the hospital, and the operation of lithotomy has been performed on the occasion of their second residence. With regard to the affections of the uterine organs it may be noticed that the two most prominent in point of frequency are malignant diseases of the womb and ovarian diseases. The former contribute but slightly to the general mortality, as it usually happens that the patients are discharged before a fatal result takes place, while the others are observed to contribute more largely, owing to the dangers attendant on ovariectomy, which operation has come into more frequent use during the septennium than at any previous period.

6. Venereal diseases. The accommodation employed for

diseases of a marked venereal character amounted during the period under review to fifty-seven beds, thirty of which were available for women and twenty-seven for men. These were kept pretty constantly occupied during the period, with the result of affording treatment to 3258 cases, among which the females exceeded the males by 228. The two together represent 93 in every 1000 patients, and the entire mortality, which only amounted to nine, hardly admits of an average of three in every 1000 treated. Deaths, however, from syphilitic disease of the various organs of the body are for the most part excluded from this category, as such cases usually find their way into the medical wards, and are associated in the classification with the diseases of the special organs involved.

7. Dropsies. The group of diseases indicated under this heading is more ambiguously expressed than any others of the series, the main object being to limit the number as much as possible to those affections in which the dropsy was the prominent symptom. The number so affected has amounted to 30 in every 1000 cases, and the mortality is represented by 72 in every 1000 deaths. The relative mortality of the group, which is exceedingly high, may be taken at 23·5 per cent. Of the five entries in the list, embracing renal, cardiac, hepatic, ovarian, and scarlatinal dropsies, by far the most frequent and fatal is the first, associated with Bright's disease, and which averages 98 cases annually, with an annual complement of 28 deaths. Next in frequency on the list is cardiac dropsy, which has an annual average of 26, with five deaths, exclusive of the affections already referred to in connection with the organs of circulation. After this, but a long way behind in point of frequency and fatality, come ovarian and scarlatinal dropsies, which maintain a pretty equal proportion throughout, amounting to nine respectively each year, with a small relative mortality, which, in the case of the first-mentioned disease, has not exceeded four, and in the latter has amounted to eleven deaths during the septennium.

8. Diseases and injuries of the bones, embracing as they do all the fractures as well as all the cases of carious and diseased bones admitted to the hospital, constitute the largest group, numerically speaking, of the entire series. They comprise 123 of every 1000 admissions, and they contribute 126 to every 1000 deaths,

while the relative mortality (little over 10 per cent.) is mainly attributable to fractures of the skull, pelvis, and spine, and to multiple injuries. Cases of caries, necrosis, and other affections of bone, barely average one fifth part of the entire number, the greater proportion being made up of fractures in the following proportions: Fractures of the upper extremity present an annual average of sixty cases, the greater portion of which must be looked upon as of a peculiar or complex character, since the bulk of the accidents of this description are treated outside as surgery patients. The peculiar liability of the lower extremities to fracture and the ready admission of such accidents is exemplified by the fact that they maintain an annual ratio of 330, and represent by themselves more than one half of the returns registered in the class under review. Of fractures of the lower extremities, simple fractures of the tibia and fibula return an annual average of 150, while compound fractures of the same bones amount to about 47 annually, with a very fluctuating mortality from year to year, but which has averaged during the period 33 per 100 of the cases. Fractures of the femur, which are next in frequency, maintain a mean annual ratio of 78, while compound fractures of the same bone contribute an annual average of 12 cases, with a relative mortality of 50 per cent. Fractures of the skull have been registered 25 times annually, and have preserved a mean annual mortality of 16 deaths, while of 35 cases of fractured spine reported during the period, 3 only are registered as having left the hospital alive. The number and results of the various cases of fracture submitted to amputation make important features in the table of operations.

9. Diseases and injuries of joints comprise 98 per 1000 of the admissions, and only 22 in every 1000 deaths. The relative mortality does not amount to more than 2·25. The total number is perhaps unnecessarily augmented by the addition of cases of rheumatism, which could not well have been appropriated to any other class in the system of classification adopted. These cases average 183 annually, and during the period under review nine of them have been attended with fatal results. It would thus appear by deducting rheumatic affections, that the group would be represented by the reduced number of 61 in every 1000 cases, and that the relative mortality would be

increased to 3·2 per cent. First in order of frequency, after rheumatism, are diseases of the knee-joint, which are entered in the proportion of 85 annually. After this are diseases of the hip, with an annual average of 56; and those of the ankle, not exceeding 15. These numbers are reversed when reference is made to the liability to injury sustained by the respective joints, for while the knee is injured 18 times, the ankle suffers in the proportion of 37 times in the course of the year. Diseases and injuries of other joints present a small and fluctuating annual return, the most prominent of these being the elbow, which is noticed in the return as diseased 15 times, and as injured 6 times in the course of each year.

10. External injuries of soft parts, without corresponding injuries to organs mentioned in the other classified lists, embrace 66 per 1000 cases, and contribute 72 deaths to every 1000 of the total mortality. The relative mortality of the group amounts to 11·10 per cent. Simple bruises average nearly one-fourth of the whole number, while wounds—divided in the nomenclature into the three subdivisions of incised, lacerated, and contused (which are received in about equal proportions),—amount to fully one-half of the group, the remaining portion being mainly made up by burns and scalds, which return an annual average of 60 cases. In this group are also classified cases of cut-throat, by homicide or suicide (the latter greatly predominating). The two together amount to 44 cases, of which 10 died.

11. Abscesses, ulcers, and tumours. Under this multifarious heading are included 85 per 1000 of the patients, and 31 in every 1000 deaths, while the relative mortality is as low as 3·62 per cent. The main source of the mortality is due to lumbar, psoas, and pelvic abscesses, which in numerical amount do not exceed 3 per cent. of the cases. Abscesses of external parts present an average of 125 annually, or rather less than a third part of the entire group, while ulcers amount to an annual average of 170, of which the greater portion, 150, pertain to the lower extremities, the rest to miscellaneous parts. Of cancerous and malignant growths, the records give an annual average of 58 cases, leading to 6 deaths. Of this number 26, or rather less than one half, were due annually to cancerous disease of the mamma, the remainder being of a

miscellaneous character. The rest of the group is made up chiefly of diseased glands, which present an annual average of 19 cases.

12. Diseases and injuries of the eye are represented by 68 in every 1000 cases admitted to the hospital, and as the whole mortality during the period has only amounted to two, this group of diseases can scarcely be charged with contributing in an appreciable manner to the general total. As in the other special departments, a prescribed amount of accommodation (in this case consisting of two wards with fourteen patients in each) has been set apart for reception, but the numbers relieved and discharged show a great preponderance of males over females, arising from the more numerous applications from the one sex than the other. It may be noticed that under the divisional heading marked "special" in the table of classes of diseases, the ophthalmic affections greatly exceed those under the corresponding heading throughout the other subdivisions, and in fact comprise more than one third portion of all the ophthalmic cases. It is necessary to explain that the term special in this instance signifies that the patients were discharged still under treatment, and that they continued on the books as out-patients. It may be as well to mention also in this place that many of the operations entered on the list of ophthalmic operations were performed on out-patients, for the aggregate number in the list considerably exceeds the number of patients resident in the hospital during the period referred to.

13. Diseases of the skin do not contribute more than 33 per 1000 to the general total of admissions, and as might be anticipated this group of affections adds but a trifling quota to the aggregate of deaths, the total amount not exceeding 11 per 1000, while the relative mortality is marked at 3.71 per cent. Rather more than one third of the entire number is attributable to erysipelas, which maintains an annual average of 56 cases, while the deaths resulting from this source have amounted during the whole period to 25. These have been chiefly attributable to erysipelas of the face and head, and are mainly cases of traumatic erysipelas received from the outside. This must not be confounded with the intercurrent complication prone to attack patients in the wards, which is usually entered under the graver malady for which the cases may have been admitted.

Besides erysipelas, fatal results followed in four cases of glanders, five of carbuncle, two phlegmon, one phlegmasia dolens, one elephantiasis, one lepra, and one bedsores, which together account for the entire mortality of the group.

14. Fevers. Under this heading have been included all the cases of eruptive, periodic, and continued fevers, which have been received into the hospital during the period specified, as well as 55 cases of cholera admitted during the autumn of 1866, when the epidemic was prevalent in London. From a desire to avoid the dangers attendant on the practice of admitting a large number of cases of contagious disease to a general hospital, the number of fever cases appears small in comparison with the other diseases treated, amounting only to 23 in every 1000 cases, while the deaths are represented by 34 in every 1000. The relative mortality has preserved an average of 14.60, but it has been largely influenced from time to time by the type of the prevailing epidemic. The total number of cases registered as typhus has amounted to 179, and of typhoid to 217. Of the former 35, or 19 per cent., and of the latter 40, or 18 per cent., terminated fatally. These figures show a much higher mortality than is usually observed elsewhere, but in the same group are also registered cases of common continued fever to the number of 136 cases, with an accompanying mortality of five cases, which, when combined with the others, would reduce the total mortality from fevers to the less formidable average of 15 per cent., or rather less than one in seven of those attacked. Of the 55 cases of cholera, 25 terminated fatally. The remaining entries in the class, comprising a limited number suffering from the more contagious forms of eruptive fever, were for the most part removed to establishments specially instituted for their reception.

15. Miscellaneous diseases. In this the last group of the series are placed a variety of cases characterised by no special symptom or peculiarity that would justify their introduction into the classes of disease already enumerated. Their number has been reduced to as narrow limits as possible consistent with accuracy, and the result shows that out of every 1000 cases treated not more than 18 are representatives of the group, while the fatal cases number only 8 in a 1000. The relative mortality, which is almost entirely due to cases of gangrene and phagedæna,

has amounted during the period to 4·53 per cent. The diseases mentioned occur seventy-five times in the disease list, leading to twenty-four deaths. The major portion, however, of the cases are classified under the two headings of general debility and starvation, which, as far as cause and effect are concerned, are almost synonymous terms, while the remainder comprise cases of malingering, cases admitted during or after intoxication, and not a few instances of patients who left the hospital before any disease could be ascertained.

Tables V and VI represent the ages of the patients discharged, and those who have died, arranged according to the classification adopted in the previous table. The results present a striking analogy to the corresponding returns for the previous septennium, accompanied, however, with a slight increase of the death-rate at corresponding intervals of age. It will be noticed that the numbers received at various ages and their fatality differ very much. Beginning with the earlier periods of life and taking the standard of 1000 admissions at all ages, it is observed that under five years of age the gross total is represented by thirty-two, from five to ten by forty-seven, and during the interval betwixt ten and fifteen it reaches sixty-six. It then increases by manifold proportion during the next fifteen years, the quinquennium from fifteen to twenty yielding 147 to every 1000 patients at all ages, that from twenty to twenty-five 150, and from twenty-five to thirty 125. The remaining columns are decennial in their subdivisions, and the figures are observed rapidly to decline in numerical importance throughout the various intervals. Adhering to the same standard of comparison as above, the decade betwixt thirty and forty is represented by 169, that from forty to fifty by 130, from fifty to sixty by seventy-five, from sixty to seventy by thirty-nine, from seventy to eighty by ten, and above eighty by one only in every 1000 patients. The relative ages of the patients, with one or two exceptions, are but little influenced in the aggregate by the various classes of diseases treated, and are noticed to preserve throughout a pretty uniform ratio. The most remarkable exception to this rule is noticed in the case of syphilitic diseases, where the decennium from fifteen to twenty-five is represented by seventy-two per cent. of the cases admitted with these affections. When we come to separate the sexes, the preponderance of young

females over the corresponding age in the male sex treated for syphilis is very striking, not less than seventy-five per cent. of the entire number of females being under twenty years of age. Again, in diseases of the eye, it is noted that the numbers present a larger ratio during the decadence of life than in any of the other classes, and a correspondingly smaller ratio during early life. From the age of sixty to seventy and from that of seventy to eighty the numbers of ophthalmic cases are double the corresponding decennial returns from any of the other groups, while out of the thirty-three cases discharged above eighty years of age fourteen are referable to old people suffering from senile cataract and amaurosis.

Among the ages at death the first period under five years presents the highest relative mortality, amounting to 13 per cent. of all the admissions during that period of life. This may be mainly traced to the group of external injuries of soft parts, the most fatal causes of which, burns and scalds, contribute not less than eighty deaths to the general total. Diseases of respiration, mainly croup and laryngitis, contribute thirty-six more, while the remaining fifty-seven are pretty equally distributed throughout the other classes specified in the table. The ratio of deaths to the numbers discharged at given ages is best illustrated in the following tabular form :—

Under 5 years	13 per cent.	From 30 to 40 years...	13 per cent.
From 5 to 10 years ...	8 "	" 40 to 50 " ...	15 "
" 10 to 15 " ...	6 "	" 50 to 60 " ...	18 "
" 15 to 20 " ...	5 "	" 60 to 70 " ...	18 "
" 20 to 25 " ...	7 "	" 70 to 80 " ...	18 "
" 25 to 30 " ...	9 "	" 80 upwards	21 "

The ratio of deaths at the same stated periods of age to the general mortality is represented by the following percentages.

Under 5 years	5 per cent.	From 30 to 40 years...	20 per cent.
From 5 to 10 years ...	4 "	" 40 to 50 " ...	18 "
" 10 to 15 " ...	4 "	" 50 to 60 " ...	12 "
" 15 to 20 " ...	7 "	" 60 to 70 " ...	6 "
" 20 to 25 " ...	10 "	" 70 to 80 " ...	2 "
" 25 to 30 " ...	11 "	" 80 upwards	20 "

Table VII exhibits the number and results of the accidents treated in the hospital during the period under review,

distinguishing the sexes, and indicating under twenty separate headings the causes which led to the accidents, as far as these could be ascertained. The returns furnish a fair estimate of the risks to which a city population is always liable, and the comparative dangers incidental to the sexes. When compared with those of the preceding septennium, the present returns show an increase of 40 per cent. (upwards of 1600 cases), less attributable to the increased traffic of the neighbourhood, than to the removal of St. Thomas's Hospital. The annual numbers fluctuate considerably from year to year, in consequence of variations in trade, and vicissitudes in the weather, which interfere with building and other operations, especially during the winter months. The mortality resulting from the accidents generally is exceptionally high, but it would be manifestly unfair to deduce from these returns an average estimate of the risks attending special injuries, and referable to any individual cause in the list of accidents, as it should be borne in mind that the table only includes the severer class of accidents admitted to the wards, and takes no cognisance of the minor injuries, nearly five times the number, which are treated as out-patients. In comparison with that of previous returns, the rate of mortality from accidents maintains a pretty equal ratio, the present rate being indicated by a per-centage of 12·29, and the former by 12·32, or in both cases by about 1 in 8 of the number admitted. Females are, of course, much less liable than males, with one or two remarkable exceptions, to the various causes which give rise to accidents, the proportion being about 5 males to 1 female admitted, while the mortality weighs much more heavily on the weaker sex, the proportional death-rate in the male being 11·62, while in the female it is increased to 15·27. This difference is, however, almost entirely due to one cause in the table, which is too important to pass over without observation. It may be noticed that the accidents arising from burns and scalds amount to about one-thirteenth of all the cases, and to not less than 22 per cent. of all the deaths from accidents. To elucidate this cause of injury more fully it has been subdivided into four departments, comprising burns from clothes catching fire, scalds and burns from heated fluids, from explosion of gases, and from explosion of gunpowder. With regard to the three last

mentioned sources of injury, it would appear that males suffer as usual in a greater proportion than females, but in the first more frequent and deadly cause of injury from fire, women suffer in a greatly increased ratio. The average relative mortality in both sexes has amounted to not less than 60 per cent. ; males suffering at the rate of 54, and females at 63 per cent. of the cases admitted with this form of injury, while the general average of males to females admitted is in the ratio of 2 of the former to 3 of the latter sex. On comparing these figures with those of the previous septennium, it would appear that of late years the disproportion alluded to between the sexes has been diminishing somewhat, as the accompanying table will show :—

	Cured.			Dead.	
	Male.	Female.		Male.	Female.
From 1854 to 1861.....	34	60	...	37	82
„ 1861 to 1868.....	33	45	...	39	78
	<u>67</u>	<u>105</u>		<u>76</u>	<u>170</u>

Here, out of a total of 408 cases of burn from a simple and preventible cause, we have 58 in every 100 dying, and the female suffering in a nearly double proportion to the male. It is true that the majority are children who have been left without proper protection from fire in the absence of the parent, but a considerable number, and these almost entirely females, were of adult age and capable of taking care of themselves. It is gratifying to find, but not very easy to account for, a diminution perceptible of late years, and verified by the above table, in the total number of burns arising from the cause in question. We have often noticed that frosty, severe winters are more fertile in producing these accidents than periods of mild and genial weather, but this explanation will scarcely suffice to account for the diminution in this cause of accident over the time specified, and especially when contrasted with an increase in every other subdivision of the accident table. There is a possibility, perhaps, of its being due to the less inflammable character of female attire, which has undergone numerous transformations of late years.

The only other causes of injury from which women appear to suffer more from than men are falls down stairs and suicidal poisoning, but here the disproportion is so trifling that it is

scarcely appreciable, unless when contrasted with the very much greater liability of the male sex to the remaining seventeen sources of accidents. A very considerable portion of the injuries received from falling down stairs find a position in the disease list under the head of fractures, and notably so under fracture of the neck of the femur, nearly all cases of which, especially in elderly females, are attributable to this cause. With respect to the tendency of the sex to indulge in self-destruction by poison, it may be noticed that the attempts are so rarely successful that it is questionable whether the crime was ever seriously meditated in the majority of the cases. When compared with the few cases reported of accidental poisoning in the same sex, it would appear that the dangers attendant on the latter are four times as great as those arising from suicidal poisoning.

The most prolific cause of accident in the table is that arising from falls from heights, as from scaffolding, from windows, and the like. These generally are the result of building operations, and the victims are usually the mechanics and labourers employed. In number they amount to about a fifth part of all the accidents admitted, and the deaths resulting therefrom are also more numerous than from any other cause, amounting in the aggregate to 18 per cent. of all the accidental deaths. A large proportion of the causes of accident enumerated originate in the public thoroughfares, but several of the subdivisions appertain exclusively to the complicated traffic of this busy portion of the metropolis. Injuries from these causes are comprised under the separate headings of collisions between opposing forces, street vehicles, falls on the ground and from the curb stone, and violent torsions of the frame. Numerically they amount to 33 per cent., or one in three of the total of injuries from accident, and contribute 161 deaths to the total mortality, or nearly a fourth part of the whole.

While most of the causes enumerated show an increase of nearly 25 per cent. on the previous returns, it may be noticed that the number of persons received on account of railway accidents has more than doubled during the period under review; while the mortality, which from this cause formerly amounted to twenty-nine deaths in eighty-four cases, has increased to sixty-three in 169 cases. The augmentation is easily accounted for

by the additional network of railways which has been added to the south-eastern district of London. It may be noticed that next to burns from clothes catching fire no other cause of accident is so fatal in its consequences as that under consideration, which maintains a relative mortality throughout of 37 per cent.

Attempts at suicide from various causes have occurred 116 times during the period. Of these forty-four were cases of cut throat, forty-eight were poison cases, and the remainder were chiefly cases of drowning. Of the total number twenty-one terminated fatally, the female sex, as was formerly shown, suffering in a much less degree than the male.

Table VIII presents an analytical summary of all the chief surgical operations performed during the period, distinguishing the sexes, and the final result of treatment. The fatal complications, as far as these could be obtained, are entered in a separate column corresponding with the operation, and are obtained from the death-book of the hospital, in which separate entries are made by the pathologist after each post-mortem examination. Where no fatal complication is entered, it may be assumed that either no post-mortem examination had been made or that death was simply the result of the disease as in hernia, or of the injury as in the numerous cases of trephining and elevation. The vague terms shock and exhaustion, which signify anything and explain nothing, have for the most part been omitted in the column, and the principle of adhering to the entries made by the pathologist has been scrupulously adhered to. In the construction of the table which, like all the others, has been prepared from the annual statistical records, all the minor operations (such as finger amputations, and operations for harelip, anal fistulæ, and the like) have been carefully eliminated, and only the more important and critical class introduced. The first part comprises 305 amputations of every character, single and multiple, through bones and through joints, specifying the sexes and results. From this analysis it appears that the mortality over all the cases reported amounted to 39 per cent., that in males it reached to 41·1, and that in females it diminished to 29·8. The next includes excision of tumours, diseased bones and joints, together with excision, partial or complete, of various organs of the body, amounting in the aggregate to 744 cases, accompanied with a small relative mortality of 5 per

cent. Operations on blood-vessels, and reparatory and plastic operations, to the number of 155, come next in order of precedence, and the remainder are made up of operations on the urinary and genital organs, on the trachea and pharynx, and the operations consequent on hernia and other abnormal conditions of the abdominal viscera.

Table IX comprises the chief operations performed in connexion with the eye department. Here also many of the more trivial cases have been eliminated, as well as many operations classified in the annual tables, as still under treatment, and the issue of which cannot appear in the column of results. The department has undergone extensive development since the last septennial report appeared; but it is important to bear in mind that the list of operations comprises many cases in the out-patient department, as well as among the in-door patients, as may be observed on a comparison of the gross total of operations with the total number of eye diseases treated in the wards.

Tables X to XIV refer particularly to the total number of amputations performed in the hospital during the last fifteen years, and are entered here for the purpose of affording a ready comparison with other sources of reliable information. It is to be remembered, however, that these amputations are through the bones only, and that they are single operations, that is to say, that all cases requiring double amputations for injury, or for disease, have been omitted; and also that cases in which the same limb required to be amputated twice have been regarded as single amputations. The cases have been here divided into the two great sections of primary for injury, and secondary for disease, the former term comprising in addition to the amputations performed on the admission of the patients, immediately after the receipt of the injury, those also considered necessary after a longer or shorter residence in the hospital, while the secondary cases are limited to amputations for disease only.

The tables take note of 507 amputations, followed by 175 deaths, being equivalent to a mortality of 34·5 per cent. or 1 in 2·8 of those who underwent the operations. Of the whole number, 214 were amputations for injury, of which 104 or 48·6 per cent. died, and 293 were amputations for disease, of which 71 or 24·2 per cent. died.

Tables XI and XII refer to the ages of the 507 patients

and the mortality which was observed at various ages, as well as to the influence of sex on the general results. When taken in the aggregate the distinction of sex apparently forms an important element in estimating the success or otherwise of the operations under review. In the male sex the total mortality is noticed to amount to 37·7, while in the female it diminishes to 21·5; but this discrepancy is readily accounted for by the great disproportion which the female sex bears to the male in the numerical liability of the latter to primary amputation, which is now seen to be twice as fatal as secondary amputation. The only returns in the table in which the numbers in the case of the female sex are sufficiently numerous to draw deductions from, are those referring to secondary amputations of the thigh, which are seen to be 9 per cent. more fatal in the male than in the female. These figures are very nearly reversed when we come to analyse similar returns after amputation of the leg, but the numbers can hardly be accepted as of sufficient magnitude to influence the general conclusions. Taking age alone as a measure of influence, it may be observed that the intervals betwixt 20 and 40 furnish nearly one half of the total cases, each decennium contributing a nearly equal number. The relative mortality in the two periods, however, presents a remarkable difference; for while the average per-centage of deaths betwixt 20 and 30 amounts only to 24·7, from 30 to 40 it increases to 44·3. The difference in this case appears to be more than accidental, and is noticed to affect both classes of cases, primary as well as secondary. In the next decennium, from 40 to 50, the ratio of mortality is somewhat diminished, averaging 37·3; after 50 it increases perceptibly, and betwixt the ages of 60 and 70 it reaches 60 per cent. Only two operations are reported after the age of 70, one primary of the arm, and one secondary of the forearm; both patients recovered.

Table XIII indicates the places of abode of the patients prior to undergoing operation, and was drawn up with the view of ascertaining whether there were any differences in the results attending amputations on town and country cases. To avoid any discrepancy arising from the difficulty of distinguishing betwixt suburban and country cases, the table has been divided into three portions, comprising London proper, the suburbs, including the populous neighbourhoods of New Cross, Deptford,

Greenwich and Woolwich, which annually furnish a large contingent of our admissions, and lastly, the country districts and provincial towns. It is doubtful whether any evidence of a very positive character can be deduced from an analysis of this table with respect to the question at issue. The success which appears to have attended the result of primary amputations from country districts—the mortality being 9 per cent. less than in London, and 18 per cent. less than in suburban cases—is counterbalanced, though to a much less extent, by the results of the secondary amputations, which in the country cases have a death-rate 5 per cent. higher than the average of the other two. On the whole, the return certainly favours the assumption that amputations performed on country patients for injury are, as a rule, more favorable than when performed on town cases; and this accords with, and is partly accounted for by, the favorable vital condition which these patients are placed in when contrasted with the others. The majority of the country cases occur in men in the prime of life, following out-of-door occupations, and usually engaged as workmen, porters, or guards, on the various railways, in connection with which they may have met with their injuries; while the town residents are, as a rule, men of less physical strength, and suffer more from intemperate habits, to indulgence in which a large proportion of the accidents are to be attributed.

Table XIV, besides containing a retrospective annual summary of all the patients referred to in the previous tables, comprises a numerical record of patients relieved in the out-patient department during the period under review. From the nature and arrangements of the department, combined with the fleeting character of the cases, it is impossible to do more than to obtain a simple registration of the total numbers treated under the various subdivisions into which this important branch of hospital relief is arranged. The first six divisions in the list comprise the regular class of out-patients—that is to say, those only who are under the immediate care of the medical and surgical staff, and who are furnished with the means of continuing their attendance for a period of not less than eight weeks. The remaining five divisions, including what are termed casual cases, tooth extractions, minor accidents, and midwifery cases, are, for the most part, examined, prescribed for, and attended to by the senior pupils, under the superintendence of the surgeons as well

as of the house-surgeon, or by the house-physician, whose special province it is to attend to the casual medical cases. Without a special organization of this character, which, while it affords substantial relief to the poor, offers also a fertile field for practical medical education, it would be impossible in any way to meet the multifarious demands of the out-patient department.

An analysis of the details of the midwifery department during the period under review gives the following results. It may be mentioned that the charity is limited to the populous neighbourhood in the vicinity of the hospital. Taking this as a centre, it extends to a radius of a couple of miles, in all directions, except where it is limited by the river.

The number of women confined from 1861 to 1868 amounted to 11,270; among these there were 11,152 single births, 116 twin, and two triple births, making the total number of children delivered 11,390; of these 10,889 were born alive, and 501 were stillborn; of the former 5758 were males, and 5131 were female children; and of the latter 294 were boys, and 207 were girls. Of the total children, 10,986 were reported as having presented naturally, while in 404 there were abnormal presentations. Of the latter, 186 were breech, 94 were footling, 35 were face, 23 were funis, 11 were transverse, 14 were placental, and 41 were hand and arm presentations.

Of the 11,270 mothers confined there were in their—

1st confinement ...	1605	9th confinement ...	450	17th confinement ...	4
2nd " ...	1705	10th " ...	302	18th " ...	1
3rd " ...	1623	11th " ...	178	19th " ...	1
4th " ...	1481	12th " ...	96	20th " ...	1
5th " ...	1287	13th " ...	47	21st " ...	—
6th " ...	990	14th " ...	20	22nd " ...	1
7th " ...	825	15th " ...	10	23rd " ...	1
8th " ...	636	16th " ...	6	Total...	11,270

Among the mothers there were forty-five deaths, attributable to the following causes:—Puerperal fever and peritonitis twenty, hæmorrhage and collapse fourteen, ruptured uterus three, pyæmia three, while metritis, pneumonia, acute rheumatism, uræmia and diphtheria contributed one each. On comparing these returns with those of the previous septennium the total numbers show a slight diminution in the number of women con-

l, which is partly accounted for by the reduction of the in which women were attended from the hospital during first years of the series. Of late years this area has been eased, as formerly stated, with the effect of augmenting the bers considerably. The mortality among the mothers has undergone a slight increase, for, whereas formerly it amounted to 3 per 1000 of the cases, it now numbers 4 in 1000 of the women attended.

Table XV, giving the number of patients who have been totally discharged, or who have died in the hospital from its commencement to the present time, concludes the statistical results. A similar table, brought up to 1860, appeared in the previous review, but it is of importance, for many reasons, that should be inserted entire in these reports. The chief facts observable in the table are the gradual growth of the hospital, as shown by the increase of the patients from the date of its establishment to the present, and the gradual though variable reduction in the mortality calculated by decennial averages. The only reduction in the proportionate mortality which is noticed have taken place during the last century appears, for some reason not easily explained, to have received a check during the decade of the present century, after which it again perceptibly diminished till 1860, when it averaged only 9.1 per cent. From 1860 to the present time the average rate has again increased for reasons partly explained in the context, and now averages 9.7 per cent. It may be remarked that the reduction led to as having occurred prior to 1850 is only just appreciable, being marked by little more than a decimal fraction of one or most two degrees, while the decade from 1850 to 1860 is remarkable from the mortality registering six degrees less than any previous period, and this notwithstanding the occurrence of cholera in 1854, which raised the per-centage mortality of that year to 11.3. It is highly probable that this diminution was wholly attributable to the opening of a new wing of the hospital at the commencement of the period referred to, which more enlarged accommodation to the other departments, probably facilitated the admission, for a time at least, of a larger number of mild cases than were previously received. As has been shown, these causes are no longer in operation, and it may be safely anticipated that, with the completion of the

new building now in course of erection, we may be able not only to meet the greatly increased demand for accommodation, but also to afford greater facilities for carrying out the numerous sanitary requirements which experience has shown to be imperatively necessary in connection with hospitals for the sick.

TABLE I.—*Showing the numbers admitted to the Hospital, with the Results of Treatment.*

Patients in hospital 1st January, 1861	493
Admitted during the period from 1861 to 1868	34712
Total under treatment	<hr/> 35205 <hr/>
Discharged well or convalescent	17154
Relieved or improved	10679
Unrelieved	2714
Discharged for special reasons	769
Died	3423
Remaining, 1st January, 1868.	466 — 35205

Average number resident daily throughout the period, 500	{ Males, 295
	{ Females, 205
Mean residence of each patient, in days	33·67
Rate of mortality over all the cases . . 9·81 per cent.	{ Males, 10·11
	{ Females, 8·50

Medical Cases.

Average number in hospital	204	{ Males, 110
		{ Females, 94
Mean residence	34·9 days	
Rate of mortality 15·28 per cent.		{ Males, 18·50
		{ Females, 12·53

Surgical Cases.

Average number in hospital	296	{ Males, 185
		{ Females, 111
Mean residence	33 days.	
Rate of mortality 6·04 per cent.		{ Males, 6·52
		{ Females, 4·93

TABLE II.—Exhibiting the annual movement in the hospital, distinguishing the sexes.

	Surgical patients.						Medical patients.					
	Admitted.			Discharged.			Admitted.			Discharged.		
			Died.			Died.						Died.
	M.	F.		M.	F.		M.	F.		M.	F.	
1861	1678	1069		1576	1009		1149	971		968	866	114
1862	1758	1130		1618	1060		1077	923		915	808	121
1863	1977	1142		1835	1094		1001	885		810	756	106
1864	2010	1054		1862	1008		999	922		827	827	110
1865	2232	1057		2120	996		1026	891		827	783	93
1866	1952	1099		1812	1054		1060	898		832	785	132
1867	1908	1018		1790	973		965	861		773	734	133
	13515	7569		12613	7194		7277	6351		5950	5559	809

TABLE III.—Showing the per-centage mortality of the sexes in both classes of cases.

	Surgical.				Medical.			
	Total mortality per cent.		Both sexes.		Both sexes.		Both sexes.	
	M.	F.	M.	F.	M.	F.	M.	F.
1861	9.4	6.4	4.4	5.6	16.3	11.6	14.1	14.1
1862	9.6	6.6	5.4	6.2	15.2	13.	14.4	14.4
1863	9.7	6.8	5.	6.2	18.7	12.2	15.7	15.7
1864	9.5	6.8	5.	6.2	17.9	10.7	14.9	14.9
1865	9.3	6.	5.2	5.7	19.7	10.6	15.5	15.5
1866	10.6	6.9	3.9	6.4	21.3	14.3	18.	18.
1867	10.6	6.2	5.6	6.	20.4	15.3	16.	16.
	9.81	6.52	4.93	6.04	18.50	12.53	15.28	15.28

TABLE IV.
Distinguishing the Classes of Disease and Results.

DISEASES.	Total.	Cured.		Relieved.		Unrelieved.		Special.		Died.	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1. Nervous system	2609	493	403	612	463	206	158	26	15	162	71
2. Respiration.....	2780	371	237	691	417	157	72	17	12	553	253
3. Circulation.....	1363	153	165	289	218	109	45	10	2	243	129
4. Digestion.....	2252	510	356	385	302	147	94	25	13	243	177
5. Genito-urinary	3668	1019	580	597	720	141	228	48	50	156	129
6. Venereal.....	3258	1006	1202	407	452	64	50	32	36	4	3
7. Dropsies.....	1049	133	74	286	164	86	50	5	6	152	93
8. Bones.....	4285	2307	581	544	201	117	76	13	12	367	67
9. Joints.....	3416	1108	658	750	516	151	121	19	16	49	28
10. External injuries of soft parts.....	2207	1261	370	230	68	13	13	6	1	140	105
11. Abscesses, ulcers, &c.	2976	839	885	412	363	152	162	28	27	56	52
12. Eye.....	2358	495	394	568	445	107	94	147	106	2	—
13. Skin.....	1077	354	297	146	167	22	30	12	9	26	14
14. Fevers.....	801	374	230	37	17	3	3	14	6	65	52
15. Miscellaneous.....	640	153	146	98	114	22	21	36	20	20	10
	34739	10576	6578	6052	4627	1497	1217	438	331	2238	1185

TABLE V.
Showing the Ages of the Patients Discharged, arranged according to the Classes of Disease.

DISEASES.	Total.	Under 5.	5 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and upwards.
1. Nervous system	2376	48	157	259	311	269	297	441	331	168	87	8	—
2. Respiration	1974	32	59	78	199	308	287	379	314	181	104	28	5
3. Circulation	991	51	18	66	143	120	130	180	152	88	41	2	—
4. Digestion	1832	57	58	58	161	221	274	368	324	209	84	17	1
5. Genito-urinary	3383	116	64	90	244	488	520	804	588	296	144	28	1
6. Syphilis	3249	8	4	51	1366	979	400	293	103	28	14	3	—
7. Dropsies	804	24	38	34	51	104	105	182	143	88	30	5	—
8. Bones	3851	206	359	337	373	377	389	646	579	347	178	49	11
9. Joints	3339	159	253	296	560	548	404	522	355	158	65	18	1
10. External injuries of soft parts	1962	162	172	203	253	243	245	307	218	101	48	10	—
11. Abscesses, ulcers, &c.	2868	76	143	158	293	399	362	517	470	287	123	40	—
12. Eye	2356	48	104	209	309	268	229	331	249	265	230	100	14
13. Skin	1037	65	49	88	139	149	119	146	133	87	44	18	—
14. Fevers	684	18	42	81	156	121	93	98	49	21	4	1	—
15. Miscellaneous	610	16	36	63	71	93	75	96	82	43	26	9	—
	31316	1086	1556	2071	4629	4687	3929	5310	4090	2367	1222	336	33

TABLE VI.

Showing the Ages of the Patients who have Died, arranged according to the Classes of Disease.

DISEASES.	Total.	Under 5.	5 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and upwards.
1. Nervous system	233	10	8	17	25	19	29	40	42	28	12	2	1	
2. Respiration	806	36	12	15	57	117	109	209	140	75	30	5	1	
3. Circulation	372	5	14	22	29	39	43	76	69	55	17	3		
4. Digestion	420	10	10	12	29	35	37	71	87	71	46	11	1	
5. Genito-urinary	285	2	—	2	14	25	21	66	71	45	32	7	—	
6. Syphilis.....	9	—	—	—	—	2	4	2	1	—	—	—	—	
7. Dropsies	245	5	12	7	9	27	26	64	47	32	13	2	1	
8. Bones	434	14	21	21	29	35	45	76	77	68	33	12	3	
9. Joints	77	2	6	8	8	14	6	8	11	8	5	1	—	
10. External injuries of soft parts.....	245	82	33	14	12	14	20	22	21	11	9	7	—	
11. Abscesses, ulcers, &c.	108	2	5	6	6	9	12	14	20	16	14	4	—	
12. Eye	2	—	—	—	—	—	1	—	1	—	—	—	—	
13. Skin.....	40	2	—	—	1	5	4	8	8	4	6	2	—	
14. Fevers	117	2	9	3	20	22	16	21	14	8	2	2	—	
15. Miscellaneous	30	1	1	—	2	1	4	6	3	2	6	4	—	
	3423	173	131	127	241	364	377	683	612	423	225	60	7	

TABLE VII.—*Accident Cases admitted during the period.*

CAUSES OF THE ACCIDENTS.	Total.	Cured.		Died.		Mortality per cent.
		M.	F.	M.	F.	
1. Accidents on the river.....	245	214	6	25	—	10·2
2. Assaults	203	138	46	9	—	4·4
3. Attempts at suicide, excluding poison	68	29	26	7	6	19·1
4. Burns from clothes taking fire	195	33	45	39	78	60
5. Burns from heated fluids.....	169	82	59	17	11	16·5
6. Burns from explosion of gas	18	16	—	2	—	11·1
7. Burns from gunpowder	28	15	9	2	2	14·2
8. Collisions between opposing forces.....	58	48	4	6	—	10·3
9. Collisions with street vehicles and horses	763	542	109	90	22	14·6
10. Cuts and blows from sharp instruments.....	278	210	49	18	1	6·8
11. Falls down stairs	212	92	109	6	5	5·2
12. Falls from a height	1172	941	109	114	8	10·4
13. Falls on the ground	928	688	203	29	8	3·9
14. Falls of heavy weights.....	594	509	23	57	5	10·4
15. Gunshot wounds	25	19	2	4	—	16
16. Machinery accidents	266	233	5	28	—	10·5
17. Poisoning, accidental	19	13	3	1	2	15·7
18. Poisoning, intentional	48	17	23	5	3	16·6
19. Railway accidents.....	169	98	8	60	3	37·2
20. Torsions of body	65	48	12	5	1	9
	5524	3985	860	524	155	12·29

TABLE VIII.—Summary of the Principal Surgical Operations.

AMPUTATIONS OF LIMBS.	Total Cases.	Cured.		Died.		Mortality per cent. M. and F.	REGISTERED FATAL COMPLICATIONS.
		M.	F.	M.	F.		
PRIMARY, FOR INJURY.							
Thigh	24	12	—	11	1	50	Pleurisy 1, pyæmia 2, morb. cord. 1, exhaustion 1.
Leg	38	16	2	18	2	52.6	Pyæmia 7, pneumonia 1, diarrhoea 1, exhaustion 1.
Arm	24	14	1	9	—	37.5	Pyæmia 6, gangrene 1, apoplexy 1.
Forearm	10	7	—	3	—	30	Pyæmia, 2, tetanus 1.
Through Joints.							
Hip	1	—	—	1	—	—	
Knee	2	2	—	—	—	—	
Ankle and Foot	2	1	—	—	1	—	
Shoulder	3	—	—	3	—	—	Tetanus 1.
Elbow	1	1	—	—	—	—	
Wrist and Hand	3	3	—	—	—	—	
Multiple.							
Both Legs	3	1	—	2	—	—	Sloughing 1, exhaustion 1.
Thigh and Leg	4	1	—	3	—	—	Pyæmia 1.
Thigh and Arm	2	—	—	2	—	—	Pyæmia 2.
SECONDARY, FOR INJURY.							
Thigh	17	5	—	11	1	70.5	Pyæmia 5, gangrene 2, tetanus 1, shock 1.
Leg	15	6	2	7	—	46.4	Pyæmia 2, hæmorrhage 1.
Arm	5	4	—	1	—	—	Pyæmia.
Forearm	1	—	—	1	—	—	Exhaustion.
Through Hand	3	3	—	—	—	—	
" Knee-joint	1	—	—	—	—	—	
" Foot	1	1	—	—	—	—	

SECONDARY AMPUTATION, FOR DISEASE.									
	Total Cases	Cured.		Died.		Mortality per cent. M. and F.	REGISTERED FATAL COMPLICATIONS.		
		M.	F.	M.	F.				
Thigh	69	30	15	15	9	34.7	{ Pyæmia 4, gangrene 2, phthisis 1, hæmorrhage 1, Bright's disease 1, exhaustion 1. Pyæmia 5, gangrene 2. Pyæmia 2, bronchitis 1, melanosis 1, erysipelas 1. Phthisis 1, cancer 1.		
Leg	47	25	13	7	2	19.1			
Arm	12	5	2	4	1	41.6			
Forearm	7	3	2	2	—	28.5			
<i>Through Joints.</i>									
Shoulder	1	—	1	—	—	—			
Knee	1	1	—	—	—	—			
Wrist or Hand	1	1	—	—	—	—			
Ankle or Foot	7	4	2	1	—	14.2			
Total	305	146	40	102	71	39			
MISCELLANEOUS OPERATIONS.									
	Total Cases	Cured.		Died.		Mortality per cent. M. and F.	REGISTERED FATAL COMPLICATIONS.		
		M.	F.	M.	F.				
<i>Excision of Tumours.</i>									
Mammary, cancerous	112	3	103	—	6	5.3	Pyæmia 2, continued disease 3. Meningitis 1, erysipelas 1.		
" adenocèle	31	—	29	—	2	6.4			
" fibrous	4	—	4	—	—	—			
Tumours of various characters.									
Cancerous and malignant	75	43	26	4	2	8	Pyæmia 1, meningitis 1, erysipelas 1, bronchitis 1. Pyæmia 1. Pyæmia 1.		
Fibrous, fibroid and encysted	91	47	41	2	1	3.2			
Cartilaginous.	19	13	6	—	—	—			
Vascular and hævus	14	7	6	1	—	—			
Condylomatous	17	6	11	—	—	—			
Fatty	50	20	30	—	—	—			
Glandular	8	4	4	—	—	—			
<i>Excision of Diseased Joints.</i>									
Hip	4	3	—	1	—	—			
Elbow	8	4	3	1	—	—			
Knee	1	—	—	—	—	—			

TABLE VIII—continued.

MISCELLANEOUS OPERATIONS.	Total Cases.	Cured.		Died.		Mortality per cent. M. and F.	REGISTERED FATAL COMPLICATIONS
		M.	F.	M.	F.		
<i>Excision of Diseased Bones.</i>							
Bones of Cranium.....	4	3	1	—	—	—	Bronchitis 1, exhaustion 1.
" Jaw.....	21	17	2	1	1	—	
" Upper extremity	34	27	7	—	—	—	
Pelvic Bones.....	3	3	—	—	—	—	Pneumonia 1, necrosis 1, comp. fracture.
Thigh ".....	28	22	3	3	—	—	
Leg ".....	90	63	24	1	2	—	
Foot ".....	29	22	6	1	—	—	Hemorrhage 2.
Ribs.....	4	3	1	—	—	—	
Exostoses.....	21	13	8	—	—	—	
<i>Excision of Spleen</i>	2	—	—	1	1	—	Pyæmia 2, abscess of kidney 1.
" End of Stump	14	11	3	—	—	—	
" Penis.....	24	21	—	3	—	12.5	
" Testicle.....	35	32	—	3	—	8.5	Hemorrhage 1, cancer 1
" Tongue.....	1	1	—	—	—	—	
<i>Operations on Blood-vessels.</i>							
Ligature of common Carotid for aneurism	2	2	—	—	—	—	Pyæmia 1. Hemorrhage 2.
" " " for hemorrhage	2	—	—	2	—	—	
" common Iliac for aneurism	1	1	—	—	—	—	
" external Iliac ".....	2	2	—	—	—	—	Hemorrhage 1.
" " " for elephantiasis	1	—	1	—	—	—	
" " " for hemorrhage	2	2	—	—	—	—	
" femoral for aneurism	14	12	1	1	—	7.1	Hemorrhage 2.
" " " for hemorrhage	5	3	—	2	—	—	
Pressure and flexion for femoral aneurism	6	5	1	—	—	—	
Ligature of Radial for aneurism	1	1	—	—	—	—	Hemorrhage 1.
" Brachial for hemorrhage	2	2	—	—	—	—	
" Radial ".....	1	1	—	—	—	—	
" Ulnar ".....	2	2	—	—	—	—	

reparatory operations.															
Deformities from burns.....	34	13	20	—	1	2·9	Imperforate anus.								
Congenital malformations, harelip, cleft palate, &c.	44	24	19	—	1	2·2									
Deformities from disease.....	16	10	6	—	—	—									
Plastic operations for fistula.....	9	1	8	—	—	—	Pyæmia 3, extravasation 5.								
" for ruptured perineum.....	6	—	6	—	—	—									
" for ununited fractures.....	5	3	2	—	—	—									
Perineal section for stricture and extravasation ..	51	36	—	15	—	29·4	{ Suppurating kidneys 2, cancer 2. Extravasation of urine, abscess of kidney, pneumonia, shock, hæmorrhage, nephritis. Abscess of kidney, cystitis.								
Urethrotomy for foreign bodies.....	10	10	—	—	—	—									
Urethral dilatation for extraction of ditto	4	—	4	—	—	—									
Puncture of bladder per rectum	30	21	—	—	9	30·	Hæmorrhage 2, croup 6, gangrene 3, cedema 1. Peritonitis. Pneumonia.								
Lithotomy	104	91	—	13	—	12·5									
Lithotrixy	18	13	1	4	—	22·5									
Trephining and elevation	51	12	—	39	—	76·4									
Pharyngotomy	1	1	—	—	—	—									
Laryngotomy.....	2	1	1	—	—	—									
Tracheotomy	65	15	6	29	15	67·6									
Abdominal section for deformed pelvis	2	—	—	—	2	—									
"	1	—	—	—	1	—									
Cæsarean section	1	—	—	—	—	—									
Gastrotomy	4	—	—	4	—	—									
Colotomy	4	—	—	—	—	—									
Ovariectomy	44	—	21	—	23	52·2									
<i>Operations for Hernia.</i>															
Radical cure, inguinal	3	3	—	—	—	—									
" umbilical	1	—	1	—	—	—									
<i>Herniotomy, Inguinal.</i>															
Opening hernial sac	36	18	2	16	—	44·4									
Without opening sac	9	6	1	2	—	22·2									
<i>Herniotomy, Femoral.</i>															
Opening hernial sac	77	3	28	4	42	59·7									
Without opening sac.....	21	—	12	—	9	42·8									
<i>Herniotomy, Umbilical.</i>															
.....	5	1	—	1	3	—									
	1439	703	459	165	112										

TABLE IX.
Operations on the Eyes.

	Total.	Cured.		Relieved.		Unrelieved.	
		M.	F.	M.	F.	M.	F.
Eyelids :— Removal of tumours from orbit and lids.....	47		13	3	2	—	—
Entropion.....	64	29	24	4	5	2	1
Ectropion.....	34	13	7	8	6	—	—
Trichiasis.....	17	3	7	2	3	1	1
Lachrymal Apparatus :— Opening lachrymal sac.....	14	5	3	2	3	—	—
Shifting up canaliculi.....	109	25	18	28	33	2	3
Operations for strabismus.....	310	135	126	15	18	9	7
Iris :—Iridectomy.....	778	210	140	188	134	60	46
Artificial pupil.....	254	69	58	73	41	4	9
Corelipsis.....	101	27	25	24	12	7	6
Cataract :— Ordinary extraction.....	430	149	116	76	55	15	19
By scoop.....	38	15	12	4	5	1	1
By solution (needle).....	80	35	24	9	7	3	2
By suction.....	15	7	5	1	1	—	1
Removal of opaque capsule.....	33	9	9	7	5	—	3
Eye-ball :— Abcission.....	59	21	23	8	5	1	1
Excision.....	131	62	49	13	7	—	—
Staphyloma.....	27	9	10	5	3	—	—
Removal of foreign bodies.....	13	8	4	—	1	—	—
	2534	839	673	470	346	105	101

TABLE X.

Containing Single Amputations through the Bones only, performed during the last fifteen years.

	1ST FOR INJURY.						2ND FOR DISEASE.						Total.					
	Thigh.		Leg.		Arm.		Forearm.		Thigh.		Leg.				Arm.		Forearm.	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
1854.....	1	6	1	3	3	2	5	—	2	1	1	—	—	—	14	12		
1855.....	2	3	—	2	2	1	17	4	3	4	2	—	—	—	27	11		
1856.....	1	1	2	1	—	2	11	4	4	1	1	—	2	—	21	10		
1857.....	—	—	1	—	1	—	14	4	4	1	—	—	4	—	24	5		
1858.....	3	—	1	2	2	3	4	3	7	1	—	—	1	—	19	8		
1859.....	—	3	2	—	—	—	10	—	3	1	1	1	1	—	23	5		
1860.....	—	2	4	2	—	1	7	4	6	6	1	1	1	1	20	10		
1861.....	4	2	2	—	4	2	6	2	6	—	2	—	2	1	24	8		
1862.....	4	3	4	4	1	—	3	4	5	2	1	—	—	—	23	12		
1863.....	3	4	1	3	3	—	8	4	8	2	1	—	—	—	24	13		
1864.....	1	4	5	6	—	1	7	4	3	1	1	1	1	1	16	18		
1865.....	2	5	6	6	2	2	1	3	4	5	2	1	1	1	21	21		
1866.....	2	2	6	6	3	3	9	4	5	1	—	—	1	—	24	14		
1867.....	1	4	6	2	6	3	1	9	5	6	3	2	1	1	32	19		
1868.....	3	2	—	—	—	2	11	3	2	—	1	—	1	—	20	9		
Total	27	41	36	37	28	19	124	43	69	19	14	6	15	3	332	175		
Mortality per cent.	60.2		50.6		40.4		25.7		21.5		30.		16.6		34.5			

TABLE XI.
Ages and Sexes of Patients who Recovered after Amputations.

	Under 10.		10 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Primary :																		
Thigh ...	1	—	5	—	8	1	4	2	2	1	2	1	—	—	—	—	22	5
Leg	1	1	8	1	8	—	7	—	9	—	1	—	—	—	—	—	34	2
Arm ...	—	1	6	1	6	—	5	—	3	—	4	—	1	—	1	—	25	2
Forearm.	—	—	5	—	4	—	4	—	2	—	2	—	2	—	—	—	19	—
Secondary:																		
Thigh ...	12	1	21	11	24	11	10	7	11	9	4	2	1	—	—	—	83	41
Leg	4	1	13	3	10	7	9	4	7	2	2	1	5	1	—	—	50	19
Arm ...	1	—	—	—	1	5	1	—	4	—	1	1	—	—	—	—	8	6
Forearm.	1	—	1	—	3	1	1	—	—	2	2	2	1	—	1	—	10	5
	20	4	59	16	64	25	41	13	38	14	18	7	10	1	2	—	252	80

	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Primary:																		
Thigh...	2	1	5	—	7	1	—	—	9	—	5	—	—	—	4	—	—	39
Leg.....	—	—	3	—	5	—	—	—	8	—	4	—	—	—	8	—	—	37
Arm ...	4	—	3	—	2	—	—	—	3	—	5	—	—	1	—	—	—	18
Forearm	1	—	1	—	2	—	—	—	—	—	—	—	—	—	—	—	—	6
Secondary:																		1
Thigh...	2	—	9	1	6	2	—	—	2	—	2	—	—	—	1	—	—	33
Leg.....	—	—	2	2	1	2	—	—	4	—	1	—	—	—	—	—	—	12
Arm ...	—	—	—	—	1	—	—	—	2	—	1	—	—	—	1	—	—	7
Forearm	—	—	—	—	—	—	—	—	—	—	1	—	—	—	2	—	—	5
	9	1	23	3	24	5	34	9	28	3	19	—	16	1	—	—	—	3
Mortality per cent....	29.4		25.7		24.7		44.3		37.3		43.2		60.		34.5		34.5	

TABLE XIII.—Previous Residences of Amputation Cases.

	Total Cases.	Mortality per cent. General.	Primary.		Mortality per cent. Primary.	Secondary.		Mortality per cent. Secondary.
			Cured.	Died.		Cured.	Died.	
London	234	39.7	61	55	47.4	90	28	23.7
The Suburbs	149	36.2	28	36	56.2	67	18	21.2
Country Districts	124	30.6	21	13	38.2	65	25	27.7
	507	34.5	110	104	48.6	222	71	24.2

TABLE XIV.—*Retrospective Annual Summary of the Patients treated in Guy's Hospital, from 1861 to 1868.*

	1861.	1862.	1863.	1864.	1865.	1866.	1867.
IN-PATIENTS.							
Under treatment during the year	5,360	5,371	5,507	5,511	5,715	5,510	5,245
Discharged well or convalescent	2,553	2,443	2,500	2,538	2,622	2,389	2,109
Relieved	1,431	1,525	1,539	1,504	1,633	1,515	1,532
Unrelieved	309	346	367	419	400	390	483
Discharged for special reasons	126	87	89	61	71	189	146
Died	458	468	486	480	488	534	509
Rate of mortality per cent.	9.39	9.61	9.75	9.58	9.35	10.64	10.65
Average number daily resident	509	494	505	497	501	496	502
Mean residence of each in days	34.6	33.57	33.47	32.92	31.99	32.85	34.93
Number of accident cases admitted	713	810	866	875	1,051	907	911
Number of deaths from accident	78	94	100	109	102	97	101
Number of ordinary operations registered	287	315	314	301	337	342	362
Number of deaths after operation	41	44	62	66	65	60	69
Number of ophthalmic operation	55	226	501	492	656	606	638
OUT-PATIENTS.							
Surgical cases	3,091	3,025	3,403	3,851	3,749	3,807	4,125
Medical cases	3,247	3,769	3,905	3,731	2,987	3,129	3,438
Diseases of the eyes	1,675	2,812	2,348	2,477	2,312	2,461	2,914
Diseases peculiar to women	1,903	1,899	1,753	1,762	1,635	1,703	1,736
Diseases of the skin	—	—	232	493	847	684	801
Diseases of the ear	—	—	394	767	826	731	757
Casual or minor medical cases	6,608	7,466	10,140	10,347	9,747	10,045	10,414
Casual or minor surgical cases	26,674	33,210	39,380	38,375	33,446	32,827	37,985
Tooth extractions	4,060	4,821	4,544	5,299	4,789	5,141	4,748
Minor accidents	1,548	4,376	3,838	6,109	6,500	6,030	6,144
Women confined at their own homes	1,505	1,691	1,576	1,608	1,568	1,585	1,727

TABLE XV.—*Number of Patients Annually Discharged and Dead in Guy's Hospital since the commencement of the Institution in 1725, with the average per-centage mortality for each decennium.*

Year.	Total.	Dis- charged	Died.	Mortality per cent.	Year.	Total.	Dis- charged.	Died.	Mortality per cent.
1725*	—	—	83		1768...	1,858	1,648	210	
'26...	—	—	139		'69..	1,985	1,771	214	11.1
'27...	1,080	923	157						
'28...	1,480	1,276	204		1770...	2,076	1,853	223	
'29	1,846	1,572	274	14.4	'71...	2,155	1,908	247	
					'72...	2,230	1,997	233	
1730...	1,728	1,514	214		'73...	2,156	1,923	233	
'31...	1,716	1,506	210		'74...	2,194	2,010	184	
'32...	1,737	1,468	269		'75...	2,247	2,013	234	
'33...	1,939	1,683	256		'76...	2,239	2,030	209	
'34...	1,781	1,524	257		'77...	2,350	2,128	222	
'35...	1,889	1,631	258		'78...	2,412	2,187	225	
'36...	2,007	1,743	264		'79...	2,064	1,814	250	10.2
'37...	1,760	1,502	258						
'38...	1,798	1,548	250		1780...	2,405	2,129	276	
'39...	1,745	1,468	277	13.8	'81...	2,320	2,077	243	
					'82...	2,226	1,994	232	
1740...	1,895	1,587	308		'83...	2,141	1,901	240	
'41...	2,203	1,881	322		'84...	2,158	1,938	220	
'42...	2,194	1,839	355		'85...	2,539	2,335	204	
'43...	2,114	1,808	306		'86...	2,152	1,919	233	
'44...	2,002	1,714	288		'87...	1,965	1,717	248	
'45...	1,892	1,603	289		'88...	2,090	1,854	236	
'46...	1,923	1,633	290		'89...	2,469	2,256	213	10.4
'47...	2,135	1,820	315						
'48...	2,081	1,802	279		1790...	2,243	2,021	222	
'49...	2,057	1,766	291	14.8	'91...	2,037	1,815	222	
					'92...	2,166	1,891	275	
1750...	1,980	1,685	295		'93...	2,345	2,047	298	
'51...	1,890	1,639	251		'94...	2,184	1,915	269	
'52...	1,847	1,607	240		'95...	2,376	2,114	262	
'53...	1,948	1,693	255		'96...	2,466	2,209	257	
'54...	1,951	1,693	258		'97...	2,574	2,321	253	
'55...	1,873	1,607	266		'98...	2,702	2,398	304	
'56...	1,936	1,706	230		'99...	2,642	2,328	314	10.2
'57...	1,823	1,603	220						
'58...	1,749	1,588	161		1800...	2,770	2,410	360	
'59...	1,841	1,637	204	12.6	'01...	2,653	2,369	284	
					'02...	2,774	2,433	341	
1760...	1,845	1,672	173		'03...	2,680	2,371	309	
'61...	1,875	1,669	206		'04...	2,482	2,157	325	
'62...	1,907	1,673	234		'05...	2,666	2,372	294	
'63...	1,911	1,698	213		'06...	2,505	2,235	270	
'64...	1,667	1,469	198		'07...	2,856	2,553	303	
'65...	1,881	1,657	224		'08...	2,646	2,356	290	
'66...	1,900	1,692	208		'09...	2,635	2,313	322	11.6
'67...	1,847	1,641	206						

* From the decayed condition of the first registration book, it has been found impossible to calculate the numbers during the first two years of the series.

TABLE XV—*continued.*

Year.	Total.	Dis- charged	Died	Mortality per cent.	Year.	Total.	Dis- charged.	Died.	Mortality per cent.
1810...	2,669	2,384	285		1840...	3,646	3,329	317	
'11...	2,802	2,508	294		'41...	3,402	3,067	335	
'12...	2,636	2,361	275		'42...	3,694	3,353	341	
'13...	2,658	2,368	290		'43...	3,757	3,427	330	
'14...	2,637	2,407	230		'44...	3,911	3,519	392	
'15...	2,630	2,358	272		'45...	3,807	3,413	394	
'16...	2,654	2,409	245		'46...	3,789	3,380	409	
'17...	2,733	2,489	244		'47...	4,049	3,660	389	
'18...	2,555	2,303	252		'48...	3,772	3,397	375	
'19...	2,685	2,430	255	9.9	'49...	3,824	3,449	375	9.7
1820...	2,639	2,384	255		1850...	4,221	3,872	349	
'21...	2,772	2,523	249		'51...	4,526	4,109	417	
'22...	2,843	2,585	258		'52...	3,876	3,580	342	
'23...	2,734	2,474	260		'53...	3,265	2,961	304	
'24...	2,508	2,261	247		'54...	4,635	4,109	526	
'25...	2,544	2,280	264		'55...	4,302	3,898	404	
'26...	2,668	2,371	297		'56...	4,621	4,217	404	
'27...	2,774	2,492	282		'57...	4,729	4,351	378	
'28...	2,516	2,270	246		'58...	4,728	4,298	430	
'29...	2,585	2,288	297	9.9	'59...	4,670	4,254	416	9.1
1830...	2,603	2,297	306		1860...	4,635	4,215	420	
'31...	3,279	2,934	345		'61...	4,877	4,419	458	
'32...	3,043	2,756	287		'62...	4,869	4,401	468	
'33...	3,095	2,825	270		'63...	4,981	4,495	486	
'34...	3,395	3,095	300		'64...	5,002	4,522	480	
'35...	3,306	2,985	321		'65...	5,214	4,726	488	
'36...	3,470	3,161	309		'66...	5,017	4,483	534	
'37...	3,443	3,057	386		'67...	4,779	4,270	509	
'38...	3,375	3,066	309		'68...	5,078	4,612	466	
'39...	3,019	2,688	331	9.8	'69...	4,695	4,199	496	9.7

L I S T
 OF
GENTLEMEN EDUCATED AT GUY'S HOSPITAL,
 WHO HAVE PASSED THE
 EXAMINATIONS OF THE SEVERAL UNIVERSITIES, COLLEGES,
 &c. &c.,
 IN THE YEAR 1869.

University of Oxford.

Final examination for the degree of Bachelor of Medicine.

W. F. Flowers, M.A.

University of Cambridge.

Degree of Doctor of Medicine.

H. Airy, M.A.

Final examination for the degree of Bachelor of Medicine.

H. Airy, M.A.

Second Examination for the degree of Bachelor of Medicine.

F. C. Turner, M.A.

First examination for the degree of Bachelor of Medicine.

B. B. Conolly, B.A. | A. L. Galabin, M.A.

University of London.

Examination for the degree of Doctor of Medicine.

Reginald Eager. | H. C. Hilliard (Gold Medal).

Final examination for the degree of Bachelor of Medicine.

*J. R. Stocker. | †T. A. Buck.

First examination for the degree of Bachelor of Medicine.

First Division.

M. Harris. | T. Jones.
J. T. Ingoldby. | H. E. Southee.

Second Division.

C. E. S. Perkins. | P. T. Scott.
Wm. Stanger.

* First Class Honours in Medicine; First Class Honours in Midwifery; First Class Honours (Scholarship and Gold Medal) in Forensic Medicine.

† Second Class Honours in Midwifery; Third Class Honours in Forensic Medicine.

642 *Gentlemen admitted to Degrees, &c., in the year 1869.*

Excluding Physiology.

Second Division.

A. R. Betts.		A. M. Branfoot.
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Physiology only.

First Division.

W. F. R. Burgess.		A. W. Smith.
-------------------	--	--------------

Preliminary Scientific M.B. Examination.

First Division.

Henry Ashby.	|	Thomas Eastes.
	|	E. G. Russell.

Second Division.

G. T. Bettany.	|	E. R. L. Crespin.
H. S. Branfoot.	|	G. A. Dundas.

Indian Medical Service.

Edward Colson.	|	*Olliver T. Duke, M.B.
	|	T. C. H. Spencer.

Royal College of Physicians.

Examination for the Licentiatehip.

A. H. Baines.	|	W. P. Mallam.
H. Cheesman.	|	C. D. Maynard.
L. J. Moseley.	|	J. R. Morgan.
C. J. Sells.	|	G. W. Shipman.
E. F. Gaitskell.	|	Edward Elphick.
	|	Alfred Moor.

Royal College of Surgeons of England.

Final examination for the Fellowship.

J. de Liefde.	|	John Rand.
---------------	--	------------

First examination for the Fellowship.

W. A. E. Waller.	|	A. C. Roberts.
C. E. S. Perkins.	|	F. J. Carey, M.A.
H. E. Dixon.	|	M. Harris.
A. R. Betts.	|	J. T. Ingoldby.
Thomas Jones.	|	W. H. Jalland.
A. M. Branfoot.	|	N. A. R. Harrison.
	|	Ed. Bovill.

Examination for the Licentiatehip in Midwifery.

T. W. Hubbard.

* Obtained the first place in the Competitive Examination.

Gentlemen admitted to Practice, &c., in the year 1869. 643

Final Examination for the Membership.

January, 1869.

T. W. Hubbard.	B. Norman.	W. F. Flowers, M.A., M.B.
A. H. Collet, B.A.	J. T. Redmayne.	F. B. Lardner.

April.

J. D. Roberts.	Geo. Abbott.
----------------	--------------

May.

J. Reynolds.	J. R. Hughes.	L. Edwardes.
Robert Harris.	A. R. Ticehurst.	W. H. Lloyd.
C. H. W. Parkinson.	A. Moor.	

July.

A. Ashby.	E. J. Hart.	A. A. Thomas.
D. W. C. Hood.	T. S. Townsend.	F. D. Atkins.
G. W. Shipman.	George Barraclough.	O. S. Shaw.
F. M. Wallis.	J. A. Rawlings.	

November.

F. Durham.	R. B. Hogg.	W. F. Lill.
E. F. Gaitskell.	F. M. Robertson.	R. Wood.
W. P. Mallam.	E. Elphick.	A. C. Roberts.
Thomas Bird, M.A.	F. W. Laslett.	F. S. Tuck.
John Taylor.	W. E. Saunders.	

First examination for the Membership.

April, 1868.

Frederick George Larkin.

January, 1869.

E. W. Alabone.	F. D. Grayson.	B. A. Hewitt.
W. J. Johnson.	Charles Allwork.	J. H. Ewart.
A. F. Trenery.		

April.

W. E. Southee.	J. L. Shaw, B.A.	H. A. Latimer.
J. Marshall.	A. K. Newman.	R. Paramore.
H. H. J. Nicholls.	E. C. R. Roose.	F. E. Newington.
W. Perkins.	D. W. Duke.	G. D. Deeping.
W. T. P. Douglas, B.A.	S. Hosegood.	A. H. Haines.
W. T. Law.	F. C. Batchelor.	H. B. Bailey.
J. P. Allwood.	W. P. Nesbitt.	G. A. Coombe.
F. H. Clarke.	A. Cooper.	B. B. Connolly, B.A.
H. C. Turner.	T. P. Stephens.	A. H. Evans.
G. C. Cable.	T. A. Crackle.	A. R. Betts.
J. L'O. Brown.	G. A. Dundas.	G. C. Hall.
T. R. H. Clunn.	B. Rix.	F. A. Monks.
R. Galpin.	F. E. Barrow.	H. J. W. Barrow.
D. Duke.	J. E. Edwards.	Thomas Pink.
G. M. Roberts.	R. S. Armstrong.	E. J. Domville.
R. R. Frost.	J. K. Tucker, B.A.	F. C. Turner, M.A.

644 *Gentlemen admitted to Practice, &c., in the year 1869.*

May.

B. Tubb.	C. S. Ticehurst.	H. E. Waddy.
H. J. Hibberd.	E. G. Younger.	R. H. Hutchings.
T. H. B. Rodwell.		

July.

F. Seymour.	A. Matcham.	B. P. Morison.
H. G. Biggs.	F. G. Passmore.	James Reed.
G. J. Chadwick.		

November.

N. Kiddle.		C. E. Whittington.
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Apothecaries' Society.

Gold medal in Botany.

E. G. Russell.

Final Examination for the Licentiate'ship.

January, 1869.

J. D. Mason.	|	Richard Banks.
	J. D. Roberts.	

February.

J. Taylor.

March.

W. H. Lloyd.	|	George Abbott.
G. E. W. Turner.		R. G. Coombe.
F. D. Atkins.		J. P. Grover.

April.

F. S. Daldy.	|	W. J. Mason.
W. A. Marsh.		H. Adcock.
W. D. Lovell.		W. B. Taylor.
O. S. Shaw.		T. W. Lacey.
E. J. Hart.		A. Gillingham.
W. E. Farnfield.		D. G. Rowlands.
G. S. Boulton.		J. W. Ekens.

May.

James Bunting.

June.

A. H. Collet, B.A.

July.

A. Ashby.	|	A. C. Roberts.
A. R. Manby.		H. E. Hudson.
Henry Lyne.		E. F. Gaitskell.

August.

D. B. Murdoch.		W. F. Lill.
	R. Wood.	

September.

F. Lett.		W. P. Yates.
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Gentlemen admitted to Practice, &c., in the year 1869. 645

October.

E. L. Collins.
A. E. Kynaston.
G. E. K. Thorpe.

A. W. Smith.
P. Kingsford.

November.

W. Buchanan.

December.

M. S. Kavanaugh.

First Examination for the Licentiate'ship.

January.

D. G. Rowlands.

February.

N. A. R. Harrison.
H. G. Button.
D. B. Murdoch.

P. Kingsford.
A. E. Kynaston.

March.

H. W. Collins.
M. T. Kavanaugh.
H. E. Hudson.

T. G. Ledbitter.
A. R. Manby.

April.

James Bunting.

G. E. K. Thorpe.

R. C. Holman.

May.

Charles Allwork.

July.

L. Hosegood.
F. C. Batchelor.
H. H. J. Nicholls.
G. A. Coombe.

D. Duke.
H. C. Turner.
W. Greaves.
A. H. Evans.

August.

W. T. Law.

H. G. Turner.

W. Russell.

September.

W. C. Blaker.
John Marshall.
G. D. Deeping.
R. Galpin.

H. B. Bailey.
F. A. Monks.
F. H. Clarke.

October.

A. R. Newman.

November.

T. A. Crackle.

December.

J. Hasard.

GUYS HOSPITAL MEDALLISTS AND PRIZEMEN, 1868-9.**EXAMINATION OF STUDENTS IN MEDICINE AND ITS
ALLIED SCIENCES, AUGUST 3rd, 1869.***The Treasurer's Gold Medal for Clinical Medicine.*

George Abbott, Nottingham.

The Treasurer's Gold Medal for Clinical Surgery.

George Abbott, Nottingham.

Third Year's Students.

W. F. R. Burgess, Bethnal Green, London, First Prize, £40.

George Abbott, Nottingham, Second Prize, £35.

Arthur William Smith, Halifax, Honorary Certificate.

Richard Wood, Malden Road, London, Honorary Certificate.

John Jolliffe, Shepherd's Bush, Honorary Certificate.

Second Year's Students.

George Davidson Deeping, Castle Terrace, Newark, First Prize £35.

H. Bennett Bailey, Kingston House, Wis-	} Second Prize, { £15.
beach,	
Arthur Cooper, York,	} (Divided) { £15.
William Thomas Law, Holt, Wilts, Honorary Certificate.	

A. Kingcomb Newman, Lee, Kent, Honorary Certificate.

First Year's Students.

C. H. Golding Bird, Brunswick Square, London, First Prize, £30.

George Turner, Portsea, Second Prize, £25.

B. H. Williams, Haverfordwest, Third Prize, £10 10s.

J. Clague, Isle of Man, Honorary Certificate.

T. W. Jackson, Leyland, Lancashire, Honorary Certificate.

Walter Edward Hacon, Hackney, Honorary Certificate.

ENTRANCE EXAMINATION IN CLASSICS, MATHEMATICS, &c.

October, 1869.

J. N. Rigby, First Prize, £25.

W. A. Simmons, Second Prize, £20.

R. C. Gibb, Third Prize, £15.

M. S. Todd, Honorary Certificate.

PUPILS' PHYSICAL SOCIETY.*The following Prizes were awarded at the end of the Session 1868-9.*

To Mr. G. Abbott, £10, for his Essay on "Injuries of the Head."

To Mr. S. F. Murphy, £5, for his Paper on "Fever," read before the Society.

To Mr. Thos. Jones, £5, for his Paper on "Surgical Hæmorrhage."

CLINICAL APPOINTMENTS HELD IN THE YEAR 1869.

HOUSE-SURGEONS.

R. Rendle.	F. Taylor, M.B.	B. Edwards.
W. R. Cortis.	R. C. Lucas.	J. de Liefde, F.R.C.S.

RESIDENT HOUSE-PHYSICIANS.

J. F. Goodhart.	H. C. Hilliard, M.B.	F. Taylor, M.B.
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RESIDENT OBSTETRIC CLERKS.

B. Edwards.	J. de Liefde.	W. F. Flowers, M.A.,
A. H. Baines.	H. Gould.	M. B.
C. Higgins.	G. Andrews.	W. P. Mallam.
W. Chapman.	A. R. Ticehurst.	A. Ashby.
	R. C. Lucas.	

SURGEON'S DRESSERS.

F. Robertson.	G. Jones, B.A.	H. Airy, M.A., M.B.
W. E. Saunders.	F. S. Tuck.	E. L. Collins.
G. E. W. Turner.	G. Abbott.	W. Greaves.
A. Ashby.	F. Durham.	R. F. Stephens.
G. W. Shipman.	A. Gillingham.	A. R. Manby.
S. F. Murphy.	T. S. Townsend.	E. Elphick.
C. D. Maynard.	W. B. Taylor.	H. E. Waddy.
C. J. Oldham.	A. A. Thomas.	W. F. R. Burgess.
	J. T. Jones.	

CLINICAL CLERKS.

J. de Liefde.	R. Harris.	F. Durham.
F. S. Tuck.	W. B. Taylor.	A. W. Smith.
A. R. Ticehurst.	G. Abbott.	H. E. Dixon.
R. B. Hogg.	E. Aikin.	W. T. P. Douglas, B.A.
C. J. Oldham.	W. P. Mallam.	W. Eager.
J. Rigby-Hughes.	A. E. Kynaston.	J. E. B. Burroughs.

DRESSERS IN THE EYE-WARDS.

H. Gould.	E. F. Gaitkell.	W. E. Saunders.
G. Andrews.	C. E. Wing.	P. Kingsford.
R. Rendle.	H. G. Turner.	C. J. Oldham.
A. H. Baines.	F. Robertson.	R. B. Hogg.

POST-MORTEM CLERKS.

A. Gillingham.	F. Coomber.	D. W. Duke.
E. L. Collins.	T. W. Parker.	H. R. Ker.
James Bunting.	A. R. Dunnage.	F. G. Larkin.
J. H. Ewart.	H. Adcock.	F. E. Barrow.
R. H. Pritchard.	J. L. Shaw, B.A.	T. A. Crackle.
J. T. Evans.	W. E. Crowther.	J. K. Tucker, B.A.
J. Taylor.	J. W. Phillips.	C. J. W. Pinching.
W. Greaves.	R. Paramore.	

ASSISTANT-SURGEON'S DRESSERS AND DRESSERS IN THE SURGERY.

R. P. Grigson.	W. Paulson.	B. B. Connolly, B.A.
C. D. Maynard.	H. G. Button.	H. E. Waddy.
W. A. D. Fasken.	W. Buchanan.	F. G. Larkin.
T. S. Townsend.	W. F. R. Burgess.	John Morris.
T. W. Evans.	H. W. Collins.	H. E. Dixon.
W. H. Lloyd.	J. W. Phillips.	M. T. Kavanaugh.
A. Ashby.	N. A. R. Harrison.	John Jolliffe.
W. H. Laxton.	W. E. Farnfield.	J. H. Ewart.
F. Durham.	A. W. Smith.	F. Coomber.
A. Moor.	G. P. Applin.	W. H. Jalland.
C. E. S. Perkins.	W. T. P. Douglas, B.A.	James Bunting.
A. Gillingham.	J. E. B. Burroughs.	G. C. Hall.
J. W. Ekens.	A. D. Wray.	J. P. Allwood.
W. E. Saunders.	W. Garratt.	Thomas Jones.
G. Abbott.	W. E. Crowther.	John Marshall.
G. Barraclough, M.A.	R. Grant.	Richard Galpin.
R. H. Pritchard.	Thomas Pink.	E. B. Evans.
J. H. Ross.	W. Beatson.	F. E. Newington.
A. R. Manby.	E. W. Alabone.	A. K. Newman.
	W. P. Nesbitt.	

DENTAL SURGEON'S DRESSERS.

A. Gillingham.	W. Eager.	W. E. Crowther.
S. F. Murphy.	A. Ashby.	J. Jolliffe.
R. G. Coombe.	R. C. Holman.	W. A. E. Waller.
T. W. Lacey.	H. E. Dixon.	A. M. Branfoot.
E. E. Cass.	E. L. Collins.	

AURAL SURGEON'S DRESSERS.

A. C. Roberts.	W. J. Johnson.	A. Ashby.
J. de Lisle.	E. L. Collins.	F. K. Tucker, B.A.
F. G. Larkin.	W. T. P. Douglas, B.A.	J. Jolliffe.

MEDICAL WARD CLERKS.

O. S. Shaw.	C. H. W. Parkinson.	W. C. Blaker.
G. Abbott.	H. G. Peacock.	F. C. Turner, M.A.
H. E. Dixon.	W. Eager.	G. E. K. Thorpe.
B. B. Connolly, B.A.	R. H. Pritchard.	W. P. Yates.
R. C. Holman.	E. J. Hart.	W. Buchanan.
S. F. Murphy.	F. K. Tucker, B.A.	C. E. S. Perkins.
J. Morris.	W. Greaves.	M. T. Kavanaugh.
W. A. Marsh.	T. K. Clarke, M.A.	W. E. Crowther.
E. H. Steele.	A. R. Manby.	W. Beatson.
W. H. Laxton.	W. A. E. Waller.	M. Harris.
F. G. Larkin.	J. E. B. Burroughs.	J. H. Ewart.
G. W. Shipman.	R. Wood.	W. H. Jalland.
A. R. Manby.	W. F. R. Burgess.	W. Johnson.
H. G. Turner.	H. W. Collins.	F. D. Grayson.
E. E. Cass.	A. C. Roberts.	H. G. Button.
E. L. Collins.	H. D. Palmer.	G. H. Coombe.
	E. B. Evans.	

SURGICAL WARD CLERKS.

C. E. Chevallier.	J. B. Allwood.	A. E. Smith.
H. C. Turner.	H. B. Bailey.	H. R. Ker.
A. Cooper.	H. J. F. Groves.	J. J. Bowes.
C. Allwork.	C. H. G. Bird.	E. A. Burgess.
N. Kiddle.	F. Lungley.	G. J. Congdon.
A. R. Betts.	C. H. Y. Barrow.	M. S. Duke.
H. H. I. Nicholls.	G. Turner.	L. Edwardes.
A. Buchanan.	E. L. Collins.	H. J. Hibberd.
F. Seymour.	Douglas Duke.	V. D. W. Jones.
C. S. Ticehurst.	W. T. Law.	F. T. Maisey.
E. T. Domville.	J. Reed.	F. G. Passmore.
T. P. Stephens.	David Duke.	J. W. Scott.
J. de Lisle.	W. E. Hacon.	F. Wachter.
A. A. Beardsley.	R. H. Hughes, B.A.	T. R. H. Clunn.
E. H. Steele.	H. W. Stuart.	R. Dunstan.
E. L. Collins.	W. G. Nash.	H. E. Southee.
A. Gillingham.	A. H. Evans.	A. C. James.
G. Deeping.	W. Perkins.	A. E. Kessen.
E. C. R. Roose.	G. A. Dundas.	C. Jackson.
H. A. Latimer.	T. H. Palmer.	

ASSISTANT-PHYSICIAN'S CLERKS.

E. G. Younger.	James Bunting.	A. S. Ticehurst.
N. A. R. Harrison.	O. S. Shaw.	O. J. W. Pinching.
J. W. Rawlings.	H. G. Peacock.	F. E. Newington.
A. K. Newman.	E. T. Domville.	R. Galpin.
J. E. B. Burroughs.	B. P. Morison.	J. B. Allwood.
T. K. Clarke, M.A.	H. B. Bailey.	A. Cooper.
E. Bovill.	G. Deeping.	F. G. Larkin.
H. E. Hudson.	W. H. Roots.	R. S. Armstrong.
J. W. Ekens.	N. Kiddle.	D. W. Duke.
A. C. Roberts.	T. H. Tucker, B.A.	F. H. Clark.
W. J. Johnson.	F. D. Grayson.	

GUY'S HOSPITAL.

THE SESSION OF 1869-70 COMMENCED ON THE 1st OCT., 1869.

The INTRODUCTORY ADDRESS was given by
C. HILTON FAGGE, M.D.,

On Friday, the First of October, when the Prizes awarded during the past year
were also distributed.

MEDICAL OFFICERS.

Physicians.

G. OWEN REES, M.D., F.R.S.; S. O. HABERSHON, M.D.; S. WILKS, M.D.

Assistant-Physicians.

F. W. PAVY, M.D., F.R.S.; W. MOXON, M.D.; C. HILTON FAGGE, M.D.

Surgeons.

E. COCK, Esq.; J. HILTON, Esq., F.R.S.; J. BIRKETT, Esq.; A. POLAND, Esq.

Assistant Surgeons.

J. COOPER FORSTER, Esq.; THOMAS BRYANT, Esq.; ARTHUR DURHAM, Esq.

Consulting Obstetric Physician.—HENRY OLDHAM, M.D.

Obstetric Physician.—J. BRAXTON HICKS, M.D., F.R.S.

Assistant Obstetric Physician.—J. J. PHILLIPS, M.D.

Ophthalmic Surgeon.—A. POLAND, Esq.

Assistant Ophthalmic Surgeon.—C. BADER, Esq.

Dental Surgeon.—J. SALTER, Esq., F.R.S.

Aural Surgeon.—JAMES HINTON, Esq.

Medical Registrar.—C. HILTON FAGGE, M.D.

Surgical Registrar.—RICHARD RENDLE, Esq.

Apothecary.—JAMES STOCKER, Esq.

WINTER SESSION.

LECTURES.

Medicine.—Dr. OWEN REES and Dr. WILKS,
Mondays, Wednesdays, and Fridays, at Three.

Clinical Medicine.—Dr. OWEN REES, Dr. HABERSHON, and Dr. WILKS,
Saturdays, at Half-past One.

Surgery.—Mr. BIRKETT and Mr. COOPER FORSTER,
Tuesdays and Thursdays, at Half-past Three, Fridays, at Half-past Ten.

Clinical Surgery.—Mr. COCK, Mr. HILTON, Mr. BIRKETT, and Mr. POLAND,
Fridays, at Half-past One.

Anatomy, Descriptive and Surgical.—Mr. DURHAM,
Tuesdays, Wednesdays, Thursdays, and Fridays, at Nine.

Physiology and General Anatomy.—Dr. PAVY,
Mondays, Wednesdays, and Fridays, at a Quarter past Four.

Clinical Lectures on Midwifery and Diseases of Women.—Dr. HICKS,
Wednesdays, at Half-past One.

Chemistry.—Dr. ALFRED TAYLOR,
Tuesdays, Thursdays, and Saturdays, at Eleven.

Experimental Philosophy.—Dr. STEVENSON and Mr. DAVIES-COLLEY,
Wednesdays, at Twelve.

DEMONSTRATIONS.

Anatomy.—Dr. PYE-SMITH, *Daily*.

Assistant Demonstrators.—Mr. HOWSE and Mr. DAVIES-COLLEY.

Morbid Anatomy.—Dr. MOXON, *Daily*, at Half-past Two.

Cutaneous Diseases.—Dr. FAGGE, *Tuesdays*, at Twelve.

Microscope.—Mr. HOWSE, *Tuesdays* and *Fridays*, at Ten.

SUMMER SESSION.

LECTURES.

Materia Medica.—Dr. HABERSHON, *Tuesdays, Thursdays, and Fridays*, at Three.

Clinical Medicine.—Dr. PAVY, Dr. MOXON, and Dr. FAGGE,
Wednesdays, at Half-past One.

Clinical Surgery.—Mr. COOPER FORSTER, Mr. BRYANT, and Mr. DUBHAM,
Fridays, at Half-past One.

Midwifery.—Dr. BRAXTON HICKS,
Tuesdays, Wednesdays, Thursdays, and Fridays, at a Quarter to Nine.

Medical Jurisprudence.—Dr. ALFRED TAYLOR,
Tuesdays, Thursdays, and Saturdays, at Ten.

Pathology.—Dr. MOXON, *Saturdays*, at Nine.

Ophthalmic Surgery.—Mr. POLAND, and Mr. BADEE, *Mondays*, at Quarter to Nine.

Comparative Anatomy and Zoology.—Dr. PYE-SMITH,
Tuesdays and Fridays, at a Quarter to One.

Use of the Microscope.—Mr. HOWSE, *Mondays*, at Half-past Three.

Botany.—Mr. JOHNSON, *Tuesdays, Thursdays, and Saturdays*, at Half-past Eleven.

Vaccination.—Dr. PHILLIPS.

DEMONSTRATIONS.

Practical Chemistry.—Dr. STEVENSON,
Mondays, Wednesdays, and Fridays, Ten to One.

Operative and Manipulative Surgery.—Mr. BRYANT, *Wednesdays*, at Three.

The Registrars, and the Demonstrators in Anatomy and Chemistry, assist Pupils in their studies.

The Hospital contains 600 beds. Special Clinical Instruction is given by the Physicians, in wards set apart for the most interesting cases.

Diseases of Women—26 beds. Ophthalmic Cases—80 beds.

Lying-in Charity—Number of cases attended annually about 1600.

Museum of Anatomy, Pathology, Comparative Anatomy—Curator, W. Moxon, M.D.—contains 10,000 specimens, 4000 drawings and diagrams, an unique collection of Anatomical Models, and a series of 400 Models of Skin Diseases.

Gentlemen desirous of becoming Students must give satisfactory testimony as to their education and conduct. Fees—£40 for the first year, £40 for the second, and £10 for every succeeding year of attendance; or £100 in one payment, entitling the Student to a perpetual ticket.

Dressers, Clinical Clerks, Ward Clerks, Obstetric Residents, and Dressers in the Eye-Wards, are selected from the Students according to merit.

The House-Surgeons and House-Physicians have rooms and commons in the Hospital.

Six Scholarships, varying in value from £25 to £40 each, are awarded at the close of each Summer Session for general proficiency.

Two Gold Medals are given by the Treasurer—one in Medicine, and one in Surgery.

A Voluntary Examination takes place at Entrance, in Elementary Classics and Mathematics. The first three candidates receive respectively £25, £20, and £15.

Mr. STOCKER will give any further information that may be required.

ASTLEY COOPER PRIZE.

The Tenth Triennial Prize of Three Hundred Pounds,

Under the Will of the late SIR ASTLEY P. COOPER, Bart.,

WILL BE AWARDED TO

THE AUTHOR OF THE BEST ESSAY OR TREATISE

ON THE ANATOMY AND PHYSIOLOGY OF THE "LYMPHATIC SYSTEM."

The Adjudicators will consider that Essay to possess most merit which contains additional facts respecting the existence of Lymphatics in those tissues and organs hitherto thought to be devoid of them; or demonstrates the mode in which they originate, or communicate with the blood vessels; or explains the functions of the lymphatic vessels and glands in the animal body.

THE Condition annexed by the Testator is, "That the Essays or Treatises to be written for such Prize shall contain original experiments and observations, which shall not have been previously published, and that each Essay or Treatise shall (as far as the subject shall admit of) be illustrated by preparations and by drawings, which preparations and drawings shall be added to the Museum of Guy's Hospital, and shall, together with the Work itself and the sole and exclusive interest therein and the copyright thereof, become henceforth the property of that Institution, and shall be relinquished and transferred as such by the successful candidate."

And it is expressly declared in the Will "that no Physician, or Surgeon, or other officer for the time being, of Guy's Hospital or of St. Thomas's Hospital, in the Borough of Southwark, nor any person related by blood or by affinity to any such Physician, or Surgeon, for the time being, or to any other officer for the time being in either of the said Hospitals, shall at any time receive or be entitled to claim the Prize." But, with the exception here referred to, this Prize is open for competition to the whole world.

Candidates are informed that their Essays, either written in the English language, or, if in a Foreign Language, accompanied by an English translation, must be sent to Guy's Hospital on or before January 1st, 1871, addressed to the Physicians and Surgeons of Guy's Hospital.

Each Essay or Treatise must be distinguished by a Motto, and be accompanied by a sealed envelope containing the Name and Address of the Writer. None of the envelopes will be opened, except that which accompanies the successful Treatise. The unsuccessful Essays or Treatises, with the illustrative preparations and drawings, will remain at the Museum of Guy's Hospital until claimed by the respective writers or their agents.

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